REPORT RESUMES

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A GUIDE TO PROGRAMED INSTRUCTIONAL MATERIALS AVAILABLE TO EDUCATORS BY SEPTEMBER 1962.

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THIS DOCUMENT WAS A PRIMARY SOURCE OF INFORMATION TO EDUCATORS CONTEMPLATING THE USE OF PROGRAMED INSTRUCTION DURING THE ACADEMIC YEAR 1962-63. EACH ENTRY CONTAINED THE FOLLOWING INFORMATION--(1) SUBJECT MATTER, (2) TITLE, AUTHOR, AND PUBLISHER, AND (3) TEXT DESCRIPTION. (LP)

ED003781

PROGRAMS, '62

OE 34015

A Guide to Programed Instructional Materials

Available to Educators by September 1962

Compiled and Produced by

Information Division
THE CENTER FOR PROGRAMED INSTRUCTION, INC.
in cooperation with the
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Office of Education

* * *

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OE 34015

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PREFACE

As a primary source of information to educators contemplating the use of programs of instruction during the academic year 1962-63, the U. S. Office of Education has asked The Center for Programmed Instruction, Inc. to prepare a Guide to Available Programs: 1962. A committee of educators, whose schools have experimented with programed instruction, assisted in determining the information which would be most useful in making decisions about programs at this early stage of the rapidly developing field. The committee consists of: J. Bernard Everett, Assistant Superintendent for Instruction, Newton, Massachusetts; Henry Brickell, Assistant Superintendent, Manhasset Public Schools, Manhasset, New York; George Fernandez, Board of Cooperative Services of Ulster County, New Paltz, New York; Joseph O. Loretan, Associate Superintendent, Board of Education, New York City; Lloid Jones, Directorof Instruction, Denver Public Schools, Denver, Colorado; Ernest Weinrich, Board of Cooperative Educational Services, Huntington, New York; and Reginald Neuwien, Director, Administrative Research Department, Educational Research Council, Greater Cleveland, Ohio.

At present the Guide consists of descriptive information and the sample frames for each program. Despite the committee's expressed desire to include internal indices of quality control for the programs, the lack of research evidence at this time makes such indices unreliable at best. An interim statement of policy on criteria for programed materials has been prepared by a joint committee of the American Educational Research Association, the American Psychological Association, and the Department of Audio Visual Instruction of the N. E. A. The complete text of this statement may be found in Appendix B. If current research[1] proves fruitful, such evaluative guidance will be provided in the future.

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[1] Such as the Carnegie-supported Educational Testing Service study to determine evaluative criteria suitable for application to programed instructional materials.

The need for a guide of this sort is obvious in the field; this edition (20,000 copies) will hopefully establish a valuable precedent in directing educators to both number and kind of programs available. Rather than attempt to evaluate these programs, the purpose is to transmit sufficient information for users to make their own intelligent decisions. It is the Center's firm conviction that supplying sufficient information for the decision-maker is preferable to a more authoritarian "stamp of approval."

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INTRODUCTION

This volume contains the results of the first half of a two-part survey dealing with:

1. Available programed instructional materials.
2. The use of these materials in schools.

The survey is being carried out by the Center for Programed Instruction, Inc., under contract from the U. S. Office of Education.

Original publication plans called for a single volume with its two sections so arranged and cross-indexed that the reader might look up programs in the first section, and find publisher-supplied information (including preliminary testing results); in the second section he would be able to find information on how such programs are being used in schools, along with the reactions of teachers, administrators, students, etc., to these materials.

However, as a result of an increasing demand from educators for a reliable list of programs, the decision was made to issue the information from publishers immediately so that it might serve as a guide to schools purchasing materials for use during the 1962-63 school year. Therefore, Programs '62 contains information received from publishers[1] on programs which these publishers have acknowledged they will be able to supply to schools by September, 1962. Hopefully, the second part of this guide (information drawn from the school-user survey) will be available before that date; meanwhile this document is offered as a first step toward a much needed purchaser's guide to programed material.

While this volume is primarily an annotated bibliography of programed materials, a number of statistical summaries have been appended to give the educational decision-maker something more helpful than simply a list of published programs.

The sample sequences (in the proportion of one "sample page" per thousand frames in a program), have been included for two reasons: First, to give the potential buyer some idea of the style of programing and the approach that is being taken toward a subject matter; second, it was felt that if by February a publisher was not able to supply a sample sequence from a program scheduled for publication by September, the program ought not to be included in the body of this survey.

---

[1] See page 369.

In this regard, the Center wishes to thank the many publishers who stated that although they hoped to have programed materials available for the Fall, they did not wish to be listed and take the chance of misleading schools as to what was available. As one publisher put it, "There has already been too much selling of what hasn't been ready in this business."

One of the most striking things about this report is that it lists only 122 programs. This is seemingly a contradiction to the number of programs reported in an earlier survey by Finn and Perrin.[2] The discrepancy between the 630 programs which they report and the 122 programs in this guide should not be interpreted as lack of thoroughness in preparing this guide or as naivete on their part. Different criteria were applied. Finn and Perrin included in their report not simply programs which publishers had available at the time, but they also included "programs in preparation." The concept of a "program in preparation" differs considerably from publisher to publisher and may vary from a program at the printers to one still in the "idea" stage. The criteria used for this guide were twofold. Publishers were requested to submit data only for those programs which are either available for purchase at present or for which delivery could be "guaranteed" by September, 1962. Programs were not included in the guide for which sample frames could not be furnished by February 19, 1962. Thus there will probably be some additional programs not mentioned which will be published sometime during the school year 1962-63, but we have no indication that they will be available by September. In addition, the user of this guide should remember that some of the programs listed may not be available before September, 1962. There are two other factors which account for the discrepancy between this and the Finn and Perrin list. The latter included "experimental" programs which were developed for purposes of research. These programs, while available from the individual researchers who created them for other research use, are in general not available to the public, and the creators of these programs do not contemplate publishing for the school market in 1962-63. Finn and Perrin also included a few programs which are available at present, but which have little or no relevance to the school curriculum. Programs on contract bridge bidding and chess playing, for example, have not been included in this guide, though they are available. Programs on programing and programed instruction have been included as they are used in many colleges as well as for in-service training in schools.

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[2] James D. Finn and Donald G. Perrin, Teaching Machines and Programed Learning, 1962: A Survey of the Industry. Occasional Paper #3, NEA, Technological Development Project, University of Southern California, Los Angeles, p. 32.

In conclusion, it seems that programed instruction is producing change in the practices of publishers of educational material. There are still relatively few programs available, and many of these are duplicates of each other. The majority of the programs are "traditional" in content; however, there are programs available, especially in the sciences and mathematics, which reflect modern curricular viewpoints. Costs are high and vary considerably. Programing techniques also vary widely, and there seems to be a good bit of flexibility in terms of presentation formats for the programs. Mathematics and science programs predominate with mathematics accounting for just about one-half the total number of instructional hours available.

Needless to say a publication such as this has been a cooperative venture in more than the usual sense. The Center for Programed Instruction and the United States Office of Education simply provided a framework through which the information which publishers furnished could be brought together into a more general and meaningful form for perusal by members of the educational community. The compilers of this "guide" are equally indebted to the members of the Advisory Committee who took time from their regular duties to assist in the creation of the questionnaire as well as to advise on other matters.

While the major responsibility for the publication of the guide was undertaken by Dr. Lincoln F. Hanson of the C.P. I. 's Information Division, the extremely helpful analysis and interpretation of the overall data and its representation in graphic form is the work of Lewis D. Elgen and Robert Filep.

Members of the Center's Staff who also contributed to the preparation of the manuscript are Daphne Bakalis, Marion Bell, Carol Christman, and Helen Geiger.

P. Kenneth Komoski, President

The Center for Programmed Instruction

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STATISTICAL SUMMARY

As a beginning, one might examine the availability of programs and the number of instructional hours by grade levels. In many cases, programs were intended for a range of grade levels; for instance, 4-6. Figure 1 depicts the number of programs which are utilizable at each grade level. The publisher's range was taken as the criterion, and thus, one program could be counted as utilizable at several grade levels. In some cases, the lack of publisher-supplied data made it necessary for the researchers to make an assignment to grade level on the basis of their knowledge of existing curriculum. It seems that the great bulk of the programs are available for utilization from grades 4 through 13; the mode seems to be at the eighth grade where 31 programs appear to be usable.

There are relatively few programs available for the primary grades. The programs listed under the category of "special education" refer to programs specifically designed for the retarded student. These have not been assigned to any particular grade level since, in the opinion of the researchers, they form a special category of programs.

Figure 2 gives data on the number of hours of programed materials at each grade level. Assignment was made in the same way as for Figure 1. By and large, the number of hours of available programed materials increases as the grade level increases. The glaring exception to this is the ninth grade. This is partially accounted for by the several existent algebra programs which caused the ninth grade to be the mode.

Table 1 reflects the current trend in "styles of programing." Most striking here is the utilization of composite programing techniques. Sequences of constructed response frames are sometimes branched and in many cases multiple-choice responses are used without branching. The so-called "Crowder style" of programing characterized by no constructed responses, multiple-choice responses always, and branching used at all times, accounts for approximately 8% of the total. The so-called "Skinner style" seems to be the mode with constructed responses reported as usually used in most cases (51.6%), multiple-choice responses reported as sometimes used (65.6%), and branching reported as never used (78.7%). There are however, many programs that depart from what might be called the "pure" Crowder and Skinner styles.

Table 2 gives financial data on the consumer costs of the programs. The costs to the school were estimated in two ways: one, a cost per frame, the second, a cost per hour. Both are computed in cents. We included only those programs for which the publisher had provided information as to cost of the program and the number of instructional hours estimated for completion. Most startling perhaps, is the astonishing range. One program can be obtained by the school for a cost of one-tenth of a cent per frame, while the most expensive program seems to cost eighteen and a half cents per frame; the range in terms of cost per instructional hour is just as great. Schools may utilize the least expensive program for less than one tenth of a cent per instructional hour, while the cost for the most expensive one would be $8.33 per instructional hour. The range of non-programed instructional materials is usually quite narrow when one examines the different costs. Competitive textbooks, for example, are usually quite similar in price. This does not seem to be the case with competitive programs at this stage in the evolution of programed instruction. It is also of interest to note that the mean cost per frame and cost per hour for instruction are considerably higher than their respective medians. This would indicate that the distribution is being skewed by a few extremely expensive programs.

In contemplating utilization of a particular program it would be well to (1) divide the cost by the number of frames and (2) divide the cost by the number of instructional hours. Comparison of these figures with data given in Table 2 would give the educator an idea of his prospective costs compared to other programed instructional materials. It is a fairly safe assumption that the printing costs per frame do not vary a great deal from program to program, and hence the wide range is probably attributable to differential development costs and/or differential profit margins. Unfortunately it is difficult to tell whether a high price for a particular program indicates a great deal of research and care in development or excess profiteering. The reverse situation also poses a dilemma. The extremely inexpensive program may reflect a desire on the part of the publisher not to exploit a new field but on the other hand, it may be indicative of inexpensive, or hasty developmental procedures. In general, the cost of programed instructional materials seems to be considerably higher than that of textbooks in terms of equivalent content covered.

Most of the programs available for 1962-63 are "short programs." Figures 5 and 6 illustrate that the mode program is not more than a thousand frames and provides less than ten instructional hours. There are comparatively few longer programs, that is, those in excess of four thousand frames and providing more than forty hours of instruction.

The data given in Figure 3 reflect some interesting trends in terms of publication formats. 93.4% of the available programs can be obtained in a programed textbook format, while 68.9% can be obtained in a teaching machine format. 31.1% of the programs are published in a programed text format and not in a machine format, while only 6.6% of the programs are published in a machine format but not in a programed text format. There obviously is a great reluctance on the part of publishers to produce a program only in a teaching machine format. The 62.3% of the total number of programs which are published in both a teaching machine and a programed textbook format is most encouraging. Publishers are providing materials in different formats so that the schools may make the decisions as to exactly in which way the program will be presented. Of the publishers who are producing programs in machine format, very few are producing the programs so that they may be used in more than one machine. In many cases this is due to a commercial tie-up between a publisher and a teaching machine manufacturer, or the fact that the publisher and the manufacturer is one and the same. Hopefully, this pattern will be discontinued in the future and the publishers will provide wider choice for the schools. While it may be in the vested interest of the publisher that students going through programs, write in and "consume" the programs, it is encouraging to note that 32.5% of the published programs have separate answer sheets available (Fig. 4).

Another interesting phenomenon is the trend toward publication in Units. Fig. 4 illustrates that 20.2% of the programs available are published in more than one separate unit; considering the relatively small number of programs which have any extensive length at all (Figs. 5, 6) there is quite a remarkably uniform trend to publish longer programs in separate units. This is a relatively new departure for the publishing industry, and may mark an important change taking place. The availability of separate units makes for much greater flexibility in terms of curriculum decisions. One does not have to buy the entire program; one can buy only a part. Only one program published in separate units is not listed with the individual units available. The increased classroom flexibility of separate units as well as economic considerations and curriculum flexibility make the practice of publication of long programs in separate units extremely desirable.

Many of the publishers are supplying tests with the program. In some cases publishers of long programs are supplying unit tests. The responses obtained by the publishers on the test information led the researchers to believe that the data were unreliable. It seems that the industry is not quite clear as to just what a diagnostic test is, for example. Thus we would caution the user of the guide not to take the test availability information literally.

TABLES AND FIGURES

Table 1

Frequency and % Frequency of Response Modes and Branching

Total number of programs = 122

	always	usually	sometimes	never	
a) Constructed Responses are used	10 8.2%	63 51.6%	20 16.4%	29 23.8%	122
b) Multiple-Choice Responses are used	31 25.4%	2 1.6%	80 65.6%	9 7.4%	122
c) Branching is used	10 8.2%	3 2.5%	13 10.6%	96 78.7%	122

Table 2

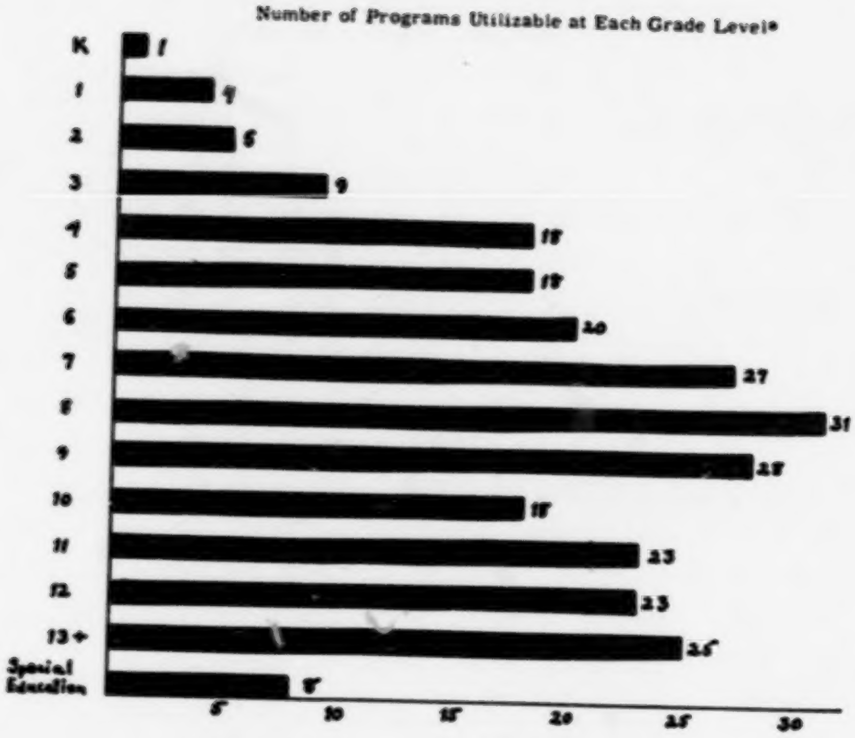
Data on consumer costs for Programs for which financial data are given*

	Cost per frame	Cost per hour of instruction
Mean	Nine-tenths of one cent	$ 1.52
Median	Six-tenths of one cent	$ .53
Range	One-tenth of one cent to 18 ⅓ cents	$ .08 to $ 8.33
Number of programs for which data were given*	83	72

*3 Language programs were not included since price included audio tapes.

Figure 1

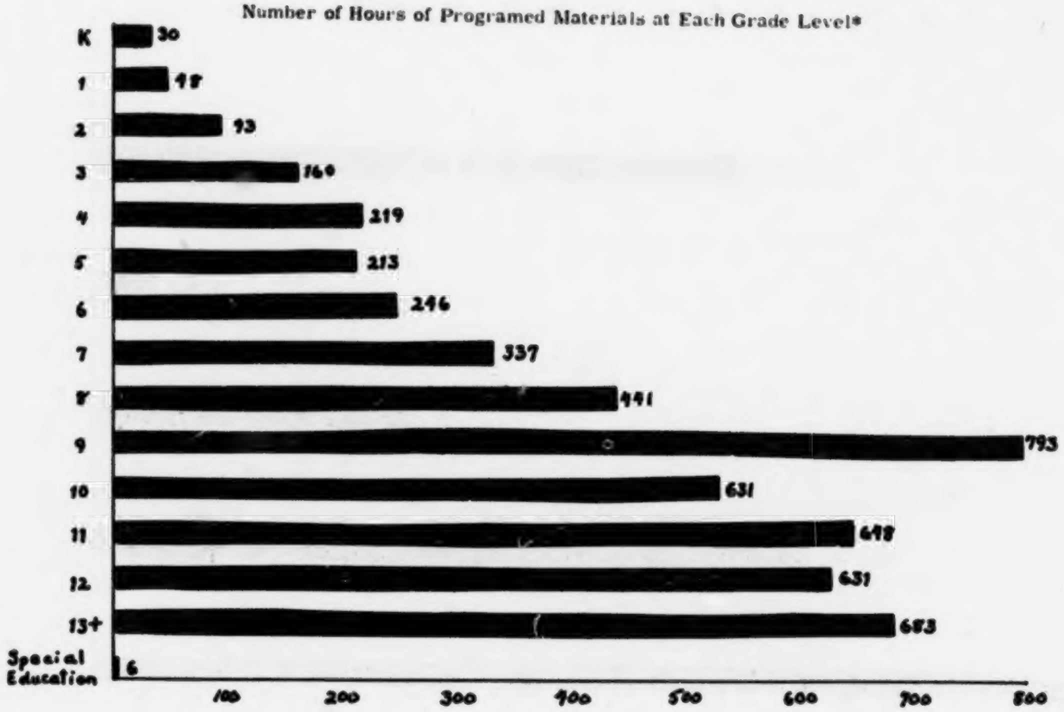
Number of Programs Utilizable at Each Grade Level*



* Publishers' data not always complete as to intended population. Data reflect assignment of programs to grade levels by researchers, based on existing curricula.

Figure 2

Number of Hours of Programed Materials at Each Grade Level*



* Publishers' data not always complete as to intended grade level. Data reflect assignment of program hours to grade levels, based on existing curricula.

Figure 3

Format and the Availability of Programs

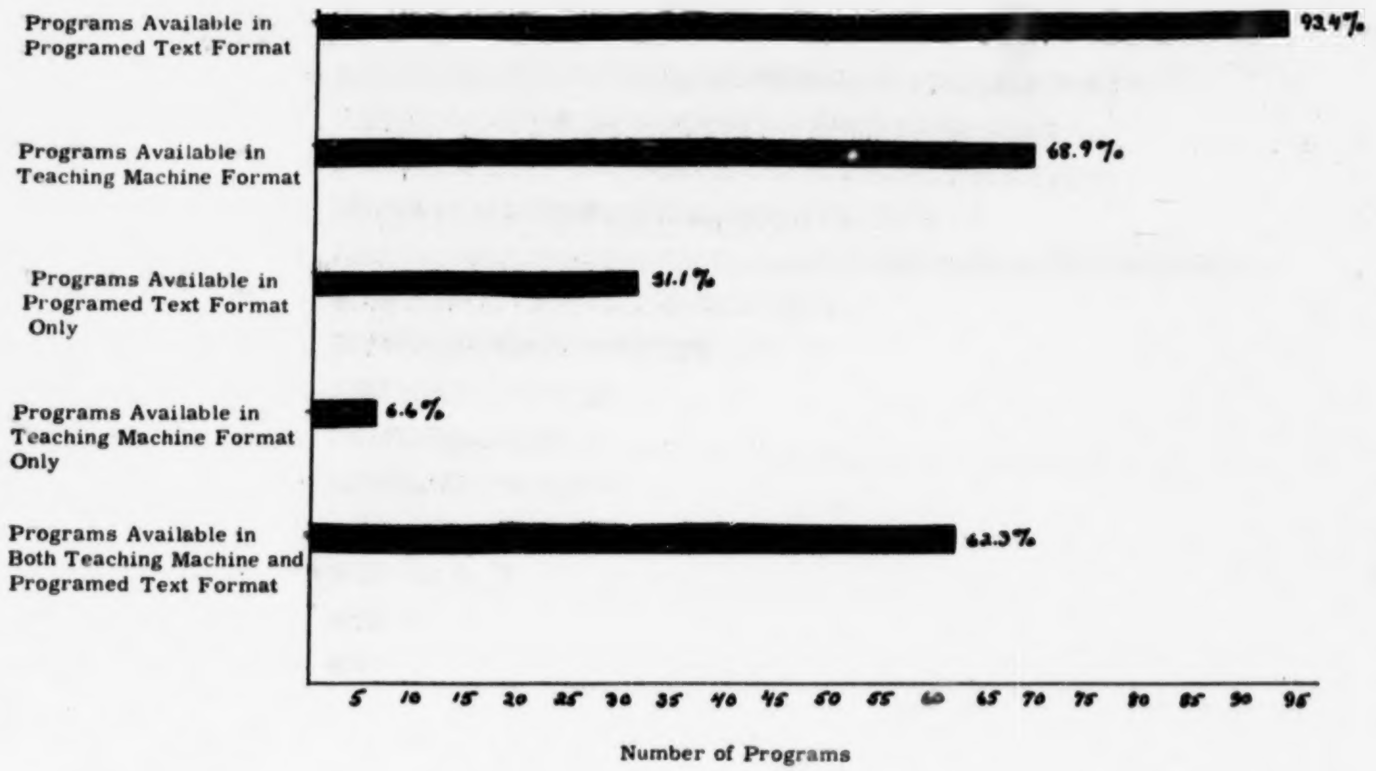


Figure 4

Answer Sheet and Separate Unit Availability for 114 Programs
in Programed Text Format

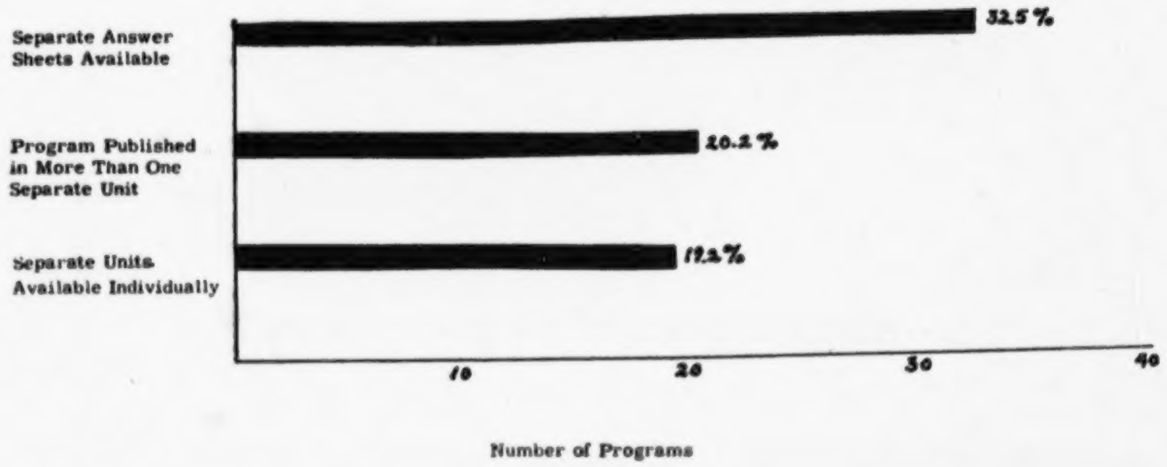


Figure 5

% Frequency Distribution of Length of Programs by Hours
Based on 102 Programs for Which Data Were Given

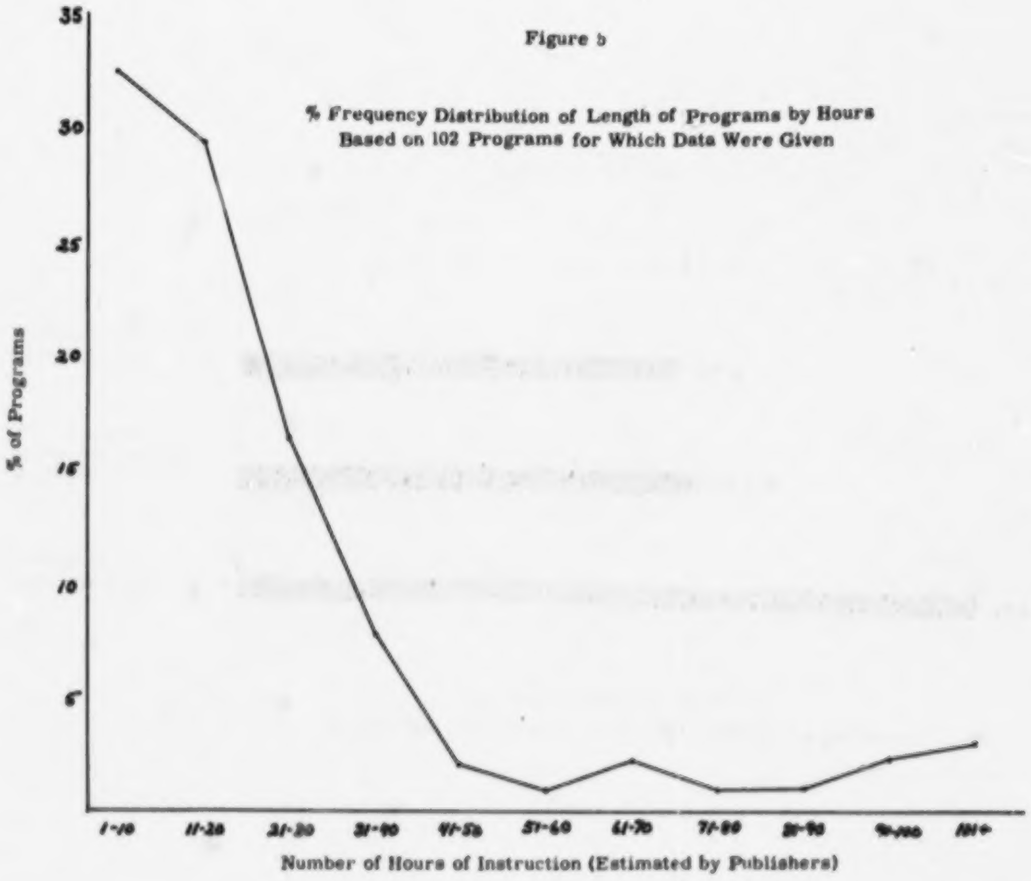


Figure 6

% Frequency Distribution of Length of Programs by Number of Frames
Based on 119 Programs for Which Data Were Given

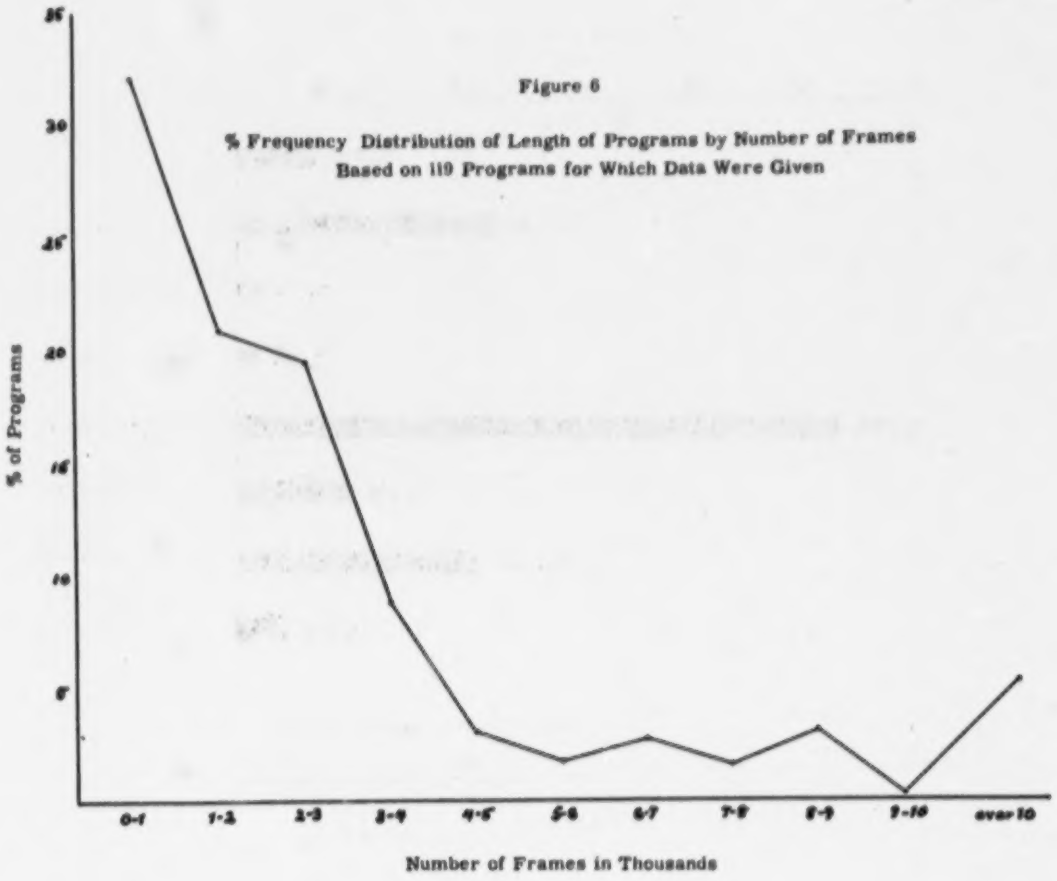


Figure 7

Programs Available, By Subject Areas

Total Number of Programs: 122

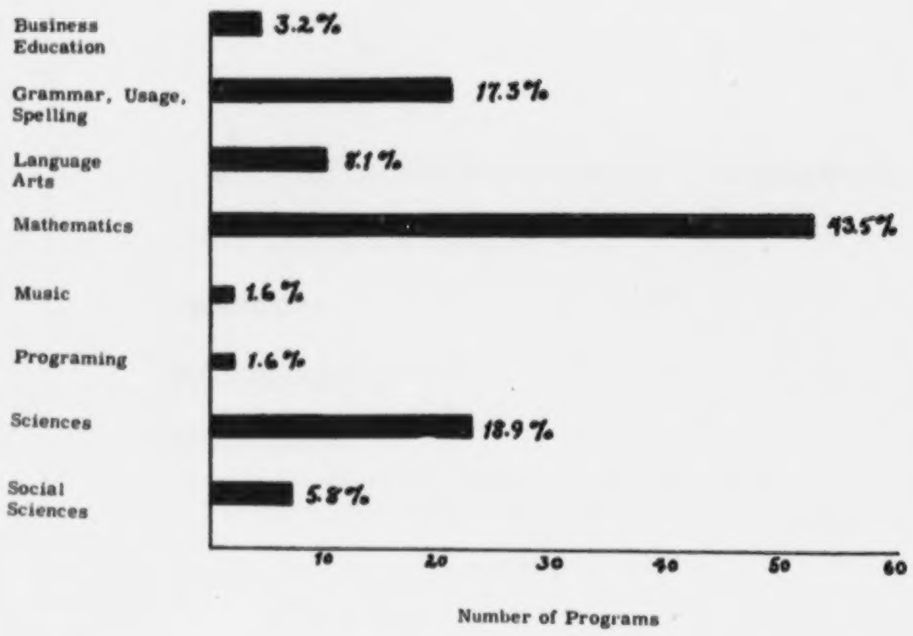
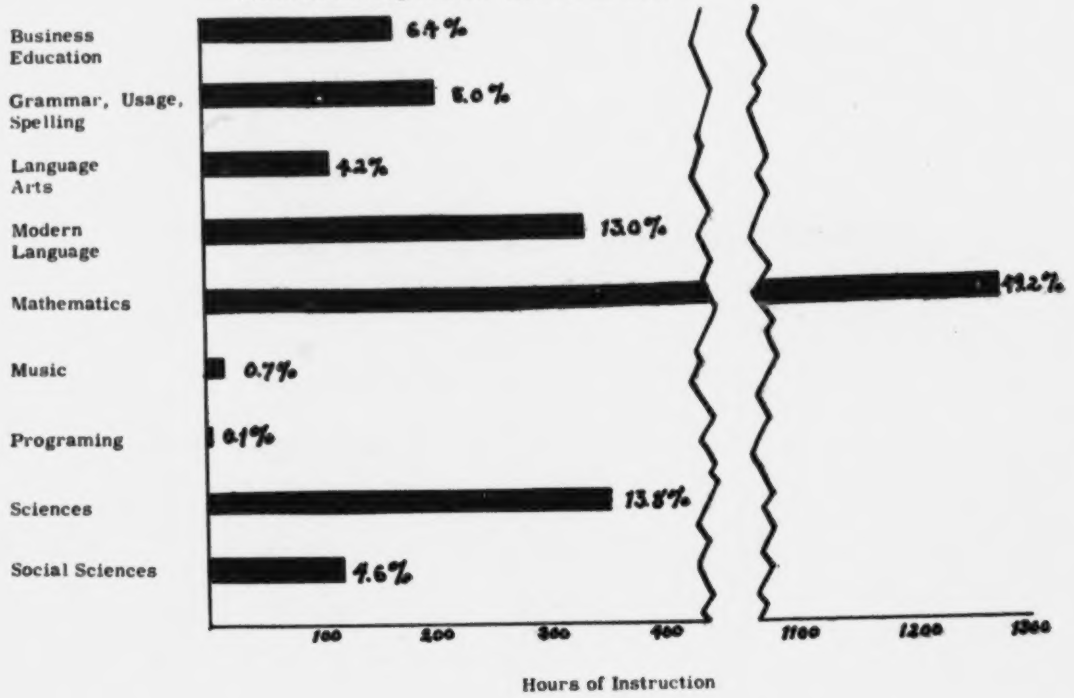


Figure 8

Hours of Programed Material Available, By Subject Area

Approximate Total Hours: 2602

Based on 72 Programs for Which Data Were Given



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USING "PROGRAMS, '62"

One of the important distinctions a potential user may want to make in connection with programs on this list is whether or not a program is available for use without a teaching machine. In the vast majority of cases this is so. The reader is further directed to check the following items as discriminative clues for machine programs.

1. If listed first "For use in ____ machine" (a few publishers appear willing to sell separate units of machine material, and their responses are thus entered).
2. If listed "specifically" or "only" for ____ machine.
3. And perhaps the ultimate criterion - if a machine is mentioned under "Additional Material or Equipment required." (Cost data were requested, but not always supplied, for this item).

Each entry consists of the following:

Subject matter - and, where supplied, approximate academic level.

Title, Author, and Publisher;
slightly edited for the format of this publication.

Text description usually has # of frames, cover, # of pages, and page size to give some picture of the nature of the material to be handled.

NOTE: Number of pages, number of frames and all cost figures should be considered only as order-of-magnitude figures; many suppliers so indicated. In supplying the cost figures, many refused even to estimate; a symbol (?) has been inserted to so indicate (the reader may wish to make his own rough guess from comparisons with similar frame and page count).

In these early programed materials, many subjects are offered in unit form; in some cases the context, in other cases sheer bulk, was the decisive factor; in either case such separate units are listed where available.

Teacher's Manual and Test availability have been slightly edited for simplest indication to the user; all final availability (here projected as of September) should be ultimately checked with the publisher.

The Form of Response and use of Branching are the simplest summary we could make of a small chart on the questionnaire, which contained far-from-uniform entries. In the future we hope to develop a form which can be reproduced directly.

Intended Population and Prerequisites are usually quoted directly. Additional Material or Equipment required was intended to bring out the need for anything, other than the programed material itself, necessary to start a student to work (with his own pencil).

Time Required To Complete programs is an estimate and should have been requested in hours - either classroom or clock; the respondent had a choice of indicating the basis of his figure. No one checked "just a guess," but the few responses with no check at all for this item have been listed as estimated. In the future the plan is to supply more test data. The few examples supplied by the present respondents were reluctantly set aside in the interest of fairness to those who might have been able to supply more data if they had been given more notice.

A few programs in "final" form may be detected by the use of past tense in the statement on "Student Data for revision." Hopefully, the almost uniform checking of this item means that the present imperfect state of the programing art is widely acknowledged by producers. The final item is simply to indicate the number of sample pages supplied (or selected from in the requested proportion of one page per thousand frames per program). The greatest problems were presented by copy supplied by programers using Branching techniques; the nature of Branching requires turning from one page back or forward as indicated; the samples have been laid out in the hope of showing this feature, even at the expense of partial page extractions.

A last word; the Center is interested in all suggestions aimed at improving future editions. Any suggestions as to the kinds of information that will help the educator to evaluate programs of the type listed in this "guide" are respectfully solicited. The evaluation of programs is largely subjective at present and may remain so for some time to come. Therefore any information which can be supplied to users enabling them to form their own opinions is highly desirable. L.F.H.

GUIDE TO PROGRAMS

GUIDE TO PROGRAMS

BUSINESS EDUCATION

SHORTHAND 33
AUDREY V. BOYD, Programer
Published by EDUCATION ENGINEERING, Inc.,
3810 Pacific Coast Highway, Torrance, Calif.

10,800 frames, for use in "SPEED" machine, $100; program reusable.
Programed text, Paperback, 360 pages, 5" X 7", 10 separate units @ $3.75 each.
Teacher's Manual available @ $4.00 per unit.
Unit, Final, Diagnostic tests available at $3.75 each, tests reusable.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

INTENDED POPULATION:
Student Prerequisites:
Additional Equipment required: "SPEED" teaching machine, $700 & $850.
Time Required to Complete program: 12 hours (based partly on data)
Student Data being used for revision.
(one sample page)

BUSINESS EDUCATION

SHORTHAND 33
Boyd; EDUCATION ENGINEERING
one sample page:

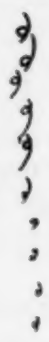
In Shorthand we omit all silent letters and write only those letters which are heard. For example: say--sa; easy--ez; knee--ne.

First, we shall introduce five letters and show the shorthand strokes which represent them.

a ○ ; e ○ ; s) ; f) ; v)

The shorthand outlines for a and e are about the size of the circle in the letters a a and e e. Also notice the three different lengths for s) : f) : v).

In the following words, watch how the circles are joined to the other strokes.

Shorthand outline	Letters used	Word
	f ā s	face
	v ā s	vase
	s ā f	safe
	s ā v s	saves
	s ā v	save
	f ē z	fees
	ē z	ease
	ē z ē	easy
	s ē	see
	s ē z	sees

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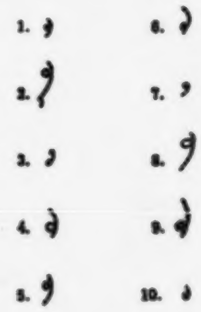
WORD	
1.	vase
2.	saves
3.	fees
4.	easy
5.	sees

SHORTHAND OUTLINE



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BUSINESS EDUCATION

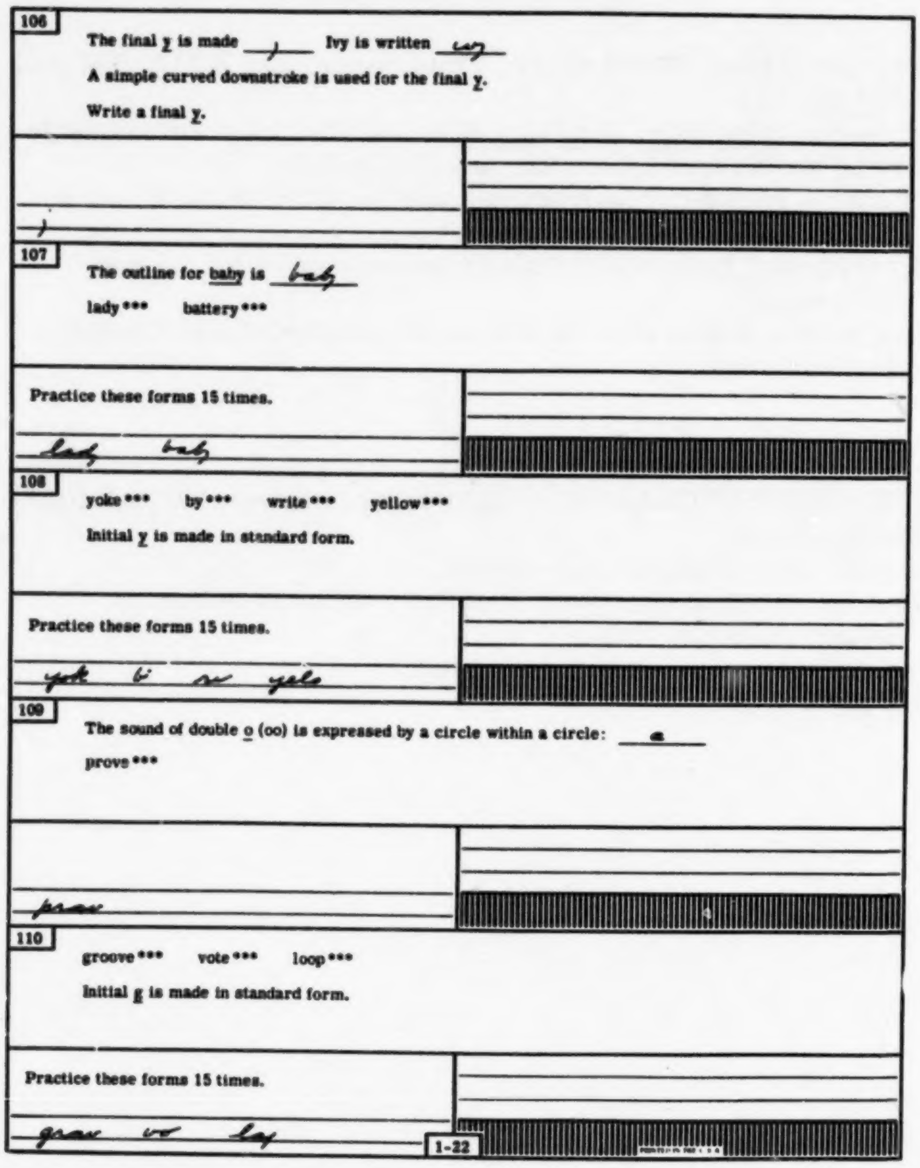
STENOSPEED
PAUL CARLSON, Programer, TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 3075 frames, Vinyl cover, $8\frac{1}{2}$" X 11", 620 pp., $15.00.
For use in Min/Max, Min/Max II machines; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
"No tests available other than those enclosed with course," not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "High-school students and adults."
Prerequisites:
No Additional Equipment required.
Time Required to Complete program: 45 to 55 hours (based solely on data.)
Student Data being used for revision.
(3 sample pages)

BUSINESS EDUCATION

STENOSPEED
Carlson; TMI-GROLIER
3 sample pages:



106

The final y is made   Ivy is written

A simple curved downstroke is used for the final y.

Write a final y.

107

The outline for baby is

lady ***   battery ***

Practice these forms 15 times.

108

yoke ***   by ***   write ***   yellow ***

Initial y is made in standard form.

Practice these forms 15 times.

109

The sound of double o (oo) is expressed by a circle within a circle:

prove ***

110

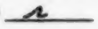
groove ***   vote ***   loop ***

Initial g is made in standard form.

Practice these forms 15 times.

1-22

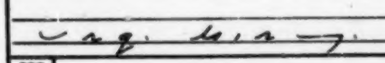
501

The brief form for are, our and hour is 

We are good. ***

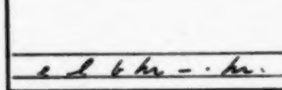
This is our money. ***

Practice the form for are, our and hour 15 times.



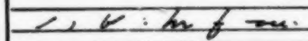
502

He will be here in an hour. ***

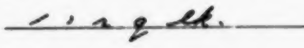


503

It is about an hour from now. ***



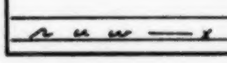
504

 ***

It is our good luck.

505

Are you with him? ***

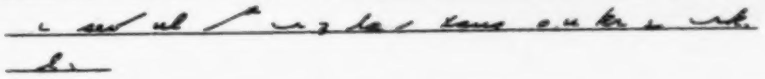


1-101

951

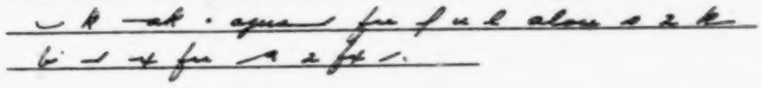
Dear Sir:

952



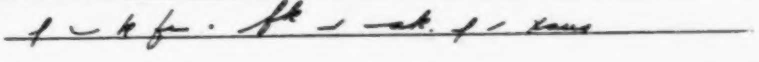
I received your letter today which says that the exhaust on your car is not working well.

953



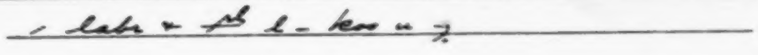
We can make an adjustment for you if you will allow us to come by in the next few days to fix it.

954



If we can find a defect in the making of the exhaust,

955



the labor and materials will not cost you anything.

1-191

BUSINESS EDUCATION

INSURANCE PREMIUM FINANCING
Published by EDUCATION ENGINEERING, Inc.
3810 Pacific Coast Highway, Torrance, Calif.

3240 frames for use in "SPEED" machine, $30; program reusable.
Programed text, Paperback, 108 pages, 5" X 7",
3 separate units @ $3.75 each.
Teacher's Manual available @ $4.00 per unit.
Unit, Final, Diagnostic tests available at $3.75 each;
tests reusable.
Multiple Choice Responses always used; no Constructed
Responses; no Branching.

INTENDED POPULATION:
Student Prerequisites:
Additional Equipment required: "SPEED" teaching machine,
$700 & $850.
Time Required to Complete program: 5 hours (based partly
on data)
Student Data being used for revision.
(two sample pages)

BUSINESS EDUCATION

INSURANCE PREMIUM FINANCING
EDUCATION ENGINEERING
two sample pages:

BLANKET AGREEMENTS (continued)

Blanket agreements will contain a provision that the insurance company will, when requested by the bank, cancel the policy on a pro-rata basis rather than the normal short-rate basis. The entire unearned premium will then be returned to the bank.

Since the blanket agreement can not cover the data on individual policies financed under it, a special endorsement will be used for each note to show the bank's interest in the policies or their proceeds.

All blanket agreements will be kept on file by the installment loan administration. Each time an office requests approval of a new loan, installment loan administration will ascertain the existence of a blanket agreement.

CB:T-1:01-S12

1. Blanket agreements will stipulate that policies cancelled by the bank will be on a _______ basis.
2. If the policy cancelled was on a _______ basis the bank would not get all of the unearned premium back.
3. Why is a special endorsement required on each note to show the banks interest in the policies and their proceeds?
4. Blanket agreements are kept on file by the _______.
5. When is the existence of a blanket agreement determined?

1. When approval of a new loan is requested.
2. short-rate
3. instalment loan administration
4. Because individual policies can not cover the data on individual blanket agreements.
5. insurance division
6. Blanket agreements can not cover the data on individual policies.
7. When the premium is sent to the insurance company.
8. When the policy goes into effect.
9. pro-rata
10. Because blanket agreements only guarantee cancellation conditions.

CB:T-1:01-Q12

GOVERNING REGULATIONS (continued)

On monthly notes, the first installment is due within 20 days of the date of the policy, which should bear the same date as the note.

If the premium is financed on a policy which is more than 20 days old, collect the down payment plus all installments due at the time the note is signed.

The entire premium should be paid to the company or agent upon receipt of of the signed endorsement. If a blanket agreement is in effect, payment should be made at once.

NOTE: A charge of 5¢ per dollar is made on late installments

CB:T-1-01-S14

1. An insurance premium is to be financed on a policy that is 55 days old. The down payment is $47.00 and the monthly payments are $23.50. How much money should be collected when the note is signed?
2. On monthly notes, the first instalment is due within ________ days of the date of the policy.
3. The date of the policy and the date of the note should be within ____ days of each other.
4. The entire premium should be paid to the company or agent upon receipt of the ________. If a blanket agreement is in effect, payment should be made ________.
5. What charge should be made for a late instalment of $69.00?

1. 0
2. signed endorsement, at once
3. $70.50
4. 30
5. 10
6. $94.00
7. signed note, immediately
8. $3.45
9. 20
10. $2.07

CB:T-1:01-Q14

BUSINESS EDUCATION

PROGRAMMED BUSINESS MATHEMATICS College
HARRY HUFFMAN, Professor, Business Education,
Va. Polytechnic Institute, with the assistance of
STUART MARGULIES, Programing Specialist and
THE CENTER FOR PROGRAMED INSTRUCTION, INC.,
New York City.
Published by McGRAW-HILL,
330 West 42nd Street, New York 36, N.Y.

Programed text, 3500 frames, Paperback, 8½" X 11", 800 pp., $ (?).
Available in 4 separate units, $ (?).
Teacher's Manual available.
Unit, Final, Diagnoistic tests available.
Constructed Responses usually used; some Multiple Choice and some Branching.

INTENDED POPULATION: "College students - Business Schools."
Prerequisites: None.
Time Required to Complete program: 100 hours (2 semesters) (based partly on data).
Student Data being used for revision.
(3 sample pages)

BUSINESS EDUCATION

PROGRAMMED BUSINESS MATHEMATICS
Huffman; McGRAW-HILL
3 sample pages:

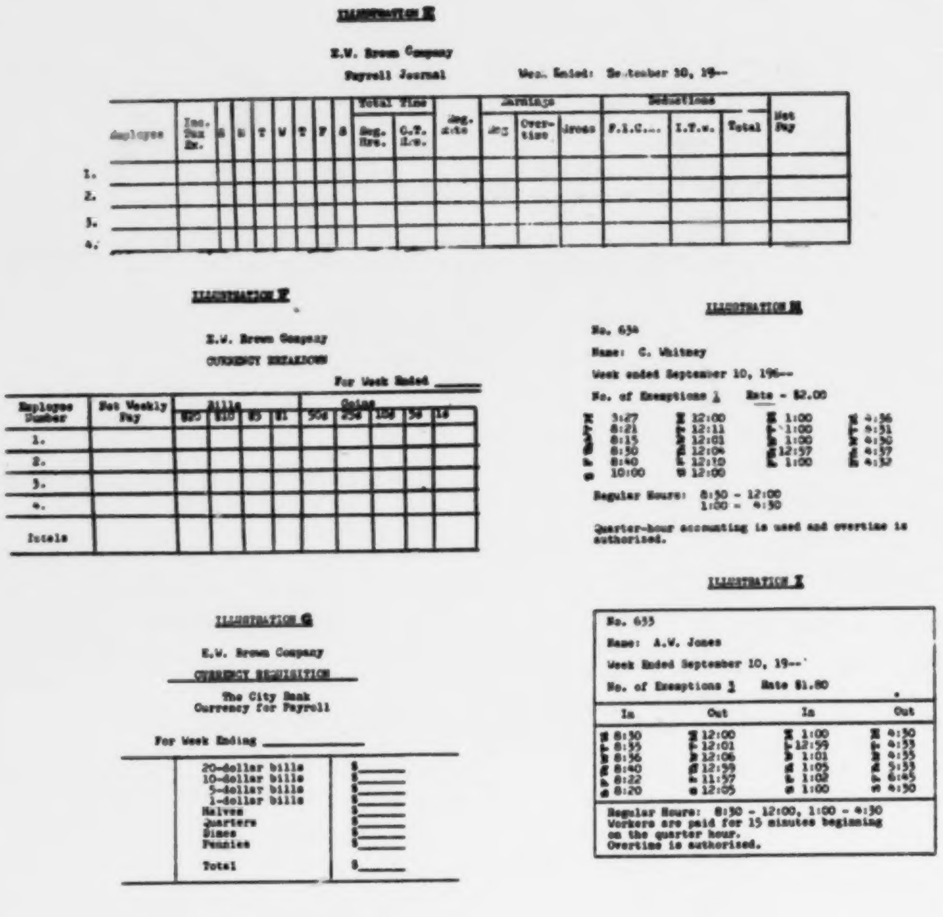


ILLUSTRATION E

E.W. Brown Company
Payroll Journal   Wee. Ended: September 10, 19--

									Total Time			Earnings			Deductions			
	Employee	Inc. Tax Ex.	S	M	T	W	T	F	S	Reg. Hrs.	O.T. Hrs.	Reg. Rate	Reg	Overtime	Gross	F.I.C.A.	I.T.W.	Total	Net Pay
1.																			
2.																			
3.																			
4.																			

ILLUSTRATION F

E.W. Brown Company
CURRENCY BREAKDOWN

For Week Ended ______

Employee Number	Net Weekly Pay	Bills				Coins				
		$20	$10	$5	$1	50¢	25¢	10¢	5¢	1¢
1.										
2.										
3.										
4.										
Totals										

ILLUSTRATION G

E.W. Brown Company
CURRENCY REQUISITION

The City Bank
Currency for Payroll

For Week Ending ____________

20-dollar bills	$______
10-dollar bills	$______
5-dollar bills	$______
1-dollar bills	$______
Halves	$______
Quarters	$______
Dimes	$______
Pennies	$______
Total	$______

ILLUSTRATION H

No. 634
Name: C. Whitney
Week ended September 10, 196--
No. of Exemptions 1   Rate - $2.00

M	3:27	M	12:00	M	1:00	M	4:36
T	8:21	T	12:11	T	1:00	T	4:31
W	8:15	W	12:01	W	1:00	W	4:30
T	8:30	T	12:04	T	12:57	T	4:37
F	8:40	F	12:10	F	1:00	F	4:32
S	10:00	S	12:00				

Regular Hours: 8:30 - 12:00
1:00 - 4:30

Quarter-hour accounting is used and overtime is authorized.

ILLUSTRATION I

No. 635
Name: A.W. Jones
Week Ended September 10, 19--
No. of Exemptions 1   Rate $1.80

	In		Out		In		Out
M	8:30	M	12:00	M	1:00	M	4:30
T	8:35	T	12:01	T	12:59	T	4:33
W	8:36	W	12:06	W	1:01	W	4:35
T	8:40	T	12:59	T	1:05	T	5:33
F	8:22	F	11:57	F	1:02	F	6:45
S	8:20	S	12:05	S	1:00	S	4:30

Regular Hours: 8:30 - 12:00, 1:00 - 4:30
Workers are paid for 15 minutes beginning on the quarter hour.
Overtime is authorized.

Q21. All of this employee's time punches were made on the quarter-hour. Determine the number of hours he worked each day. He worked a total of ________hrs. during the week.

In	Out	In	Out	Total
8:00	12:00	1:00	5:00	M________
8:15	12:00	1:15	4:45	T________
8:00	12:00	1:00	5:00	W________
10:00	12:00	1:00	2:00	Th________
8:00	11:45	1:00	3:00	F________

• • •

A21.

M	8
T	7¼
W	8
Th	3
F	5¾
Total	32

Q22. Companies usually pay by a quarter-hour system. If an employee does not arrive exactly on the quarter-hour, his time is changed to a quarter-hour.

8:02 is credited as either 8:00 or 8:15
8:22 is listed as either 8:15 or 8:30
1:07 is recorded as either 1:00 or______
1:27 is counted as either ______ or ______

• • •

A22. 1:15
1:15 or 1:30

Q23.

In	Out	In	Out
8:02	11:41	1:00	5:00

Underline the two time card punches above which must be changed to quarter-hours.

8:02 must be recorded as ______ or _______.
11:41 must be recorded as______ or _______.

• • •

A23. 8:02 11:41 1:00 5:00

8:00 or 8:15
11:30 or 11:45

Q24.

In	Out	In	Out
8:11	12:00	1:00	5:00

In order to determine this employee's pay, ________ (which time punch?) must be changed to either ______ or ______

Q11. Overtime is paid on a weekly basis. Eigen works 10, 8½, 9, 8½, 10, 4 hours at a regular pay of $1.20 an hour. Compute his pay check.

Regular hours ______________
Overtime hours ______________
Regular pay______________
Overtime pay______________
Total ______________

• • •

A11. Regular hrs. 40
O.T. hrs. 10
Regular pay $48.00
Overtime pay $18.00
Gross pay $66.00

Q12. The legal name for the Wage and Hour Law is the . . . .

• • •

A12. Fair Labor Standards Act

Q13.

Employee name	S	M	T	W	T	F	S	Reg. hrs.	O.T. hrs.	Reg. rate	Reg.	O.T.	Gross
1 Thompson		9	9	10	8	10	4			$1.40			
2													

Overtime is paid on a weekly basis. Complete this Payroll Journal.

• • •

A13.

Reg. hrs.	O.T. hrs.	Reg. pay	O.T. pay	Gross pay
40	10	$56.00	$21.00	$77.00

Q14. The . . . . Act
sets overtime pay at . . . .

• • •

A14. Fair Labor Standards Act
1½ times the regular pay for each overtime hour.

CRITERION FRAME:

Q1. E.W. Brown Company has two employees and pays overtime on a weekly basis. Their time cards are found on Figure H and Figure I. Make up and prove the payroll journal (FigureE.) Fill out currency breakdown and currency requisition forms (Figure F and Figure G.)

• • •

A1. This will be checked by the instructor

GRAMMAR & USAGE

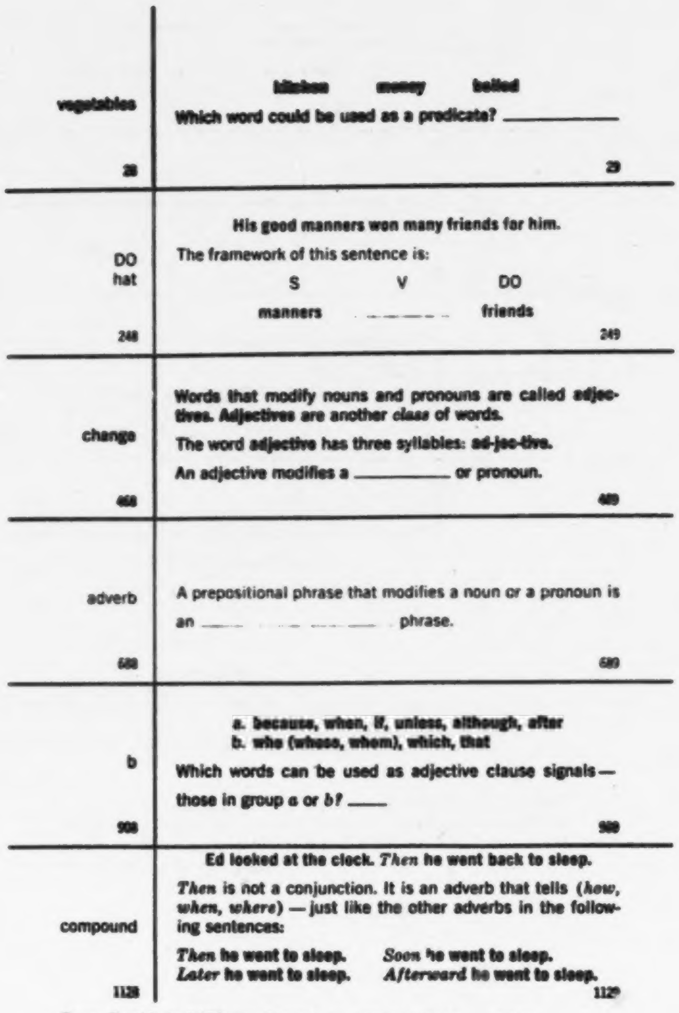
ENGLISH 2600, REVISED EDITION Junior High +
ENGLISH 3200 High School +
Scientific Program(s) in Grammar and Usage
JOSEPH C. BLUMENTHAL, Former Head of
English Department, MacKenzie High School,
Detroit, Michigan
Published by HARCOURT, BRACE & WORLD, Inc.,
750 Third Avenue, New York 17, N.Y.

2600: Programed text, 2632 frames, 6 3/8" X 9", 448 pp.,
Hardcover, $3.88,
Paperback, $2.88.
3200: Programed text, 3208 frames, 6 3/8" X 9", 544 pp.,
Hardcover, $4.36,
Paperback, $3.36.
Standard Answer Booklet available.
Teacher's Manuals available; free.
Unit, Final, Diagnostic tests available, 60¢ per set.
Constructed Responses usually used; some Multiple Choice;
no Branching.

INTENDED POPULATION: 2600: "Junior-Senior High School."
3200: "High School and College Freshmen".
Prerequisites: "Rudimentary knowledge of English grammar"
"English 2600 or acquaintance with fundamentals of English grammar."
No Additional Materials required.
Time Required to Complete programs:
2600: 9 to 20 hours (based solely on data);
3200: 14 to 28 hours (based partly on data).
Student Data being used for revisions.
(4 sample pages - English 2600;
English 3200 "will follow same format").

GRAMMAR & USAGE

ENGLISH 2600, REVISED EDITION
ENGLISH 3200
Blumenthal; HARCOURT, BRACE & WORLD
4 sample pages:



vegetables 28	**kitchen money boiled** **Which word could be used as a predicate? ________** 29
DO hat 248	**His good manners won many friends for him.** The framework of this sentence is: S V DO **manners** ________ **friends** 249
change 468	**Words that modify nouns and pronouns are called adjectives. Adjectives are another *class* of words.** The word **adjective** has three syllables: **ad-jec-tive.** An adjective modifies a ________ or pronoun. 469
adverb 688	A prepositional phrase that modifies a noun or a pronoun is an ________ phrase. 689
b 908	**a. because, when, if, unless, although, after** **b. who (whose, whom), which, that** Which words can be used as adjective clause signals—those in group *a* or *b*? ____ 909
compound 1128	**Ed looked at the clock. *Then* he went back to sleep.** *Then* is not a conjunction. It is an adverb that tells (*how, when, where*) — just like the other adverbs in the following sentences: ***Then* he went to sleep.** ***Soon* he went to sleep.** ***Later* he went to sleep.** ***Afterward* he went to sleep.** 1129

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their permission. This page will appear without change
in the Revised Edition to be published in 1962.

set 1349	**Mother (*sat, set*) the pie on the window sill to cool.** **Which verb is correct?** ______ 1350
is 1568	Don't forget that a final *s* makes a verb *singular* when it expresses present time. **Either one (*look, looks*) good on you.** 1569
older 1787	**Our new house is (*more modern, moderner*) than our old one.** 1788
ourselves 2006	In this and the following frames, underline the correct pronouns: **(*We, Us*) boys rented the cottage for a week.** 2007
o, g 2225	**The name collie would apply to *any* dog of this breed.** **The name of a *particular* dog might be Lassie or Prince.** **The name of our collie was blondie.** **In this sentence, capitalize (*collie, blondie*).** 2226
industry, hand, 2444	**I wrote to the Sterling Stamp Co. 1600 Jefferson Ave. Buffalo N.Y. for a price list.** 2445

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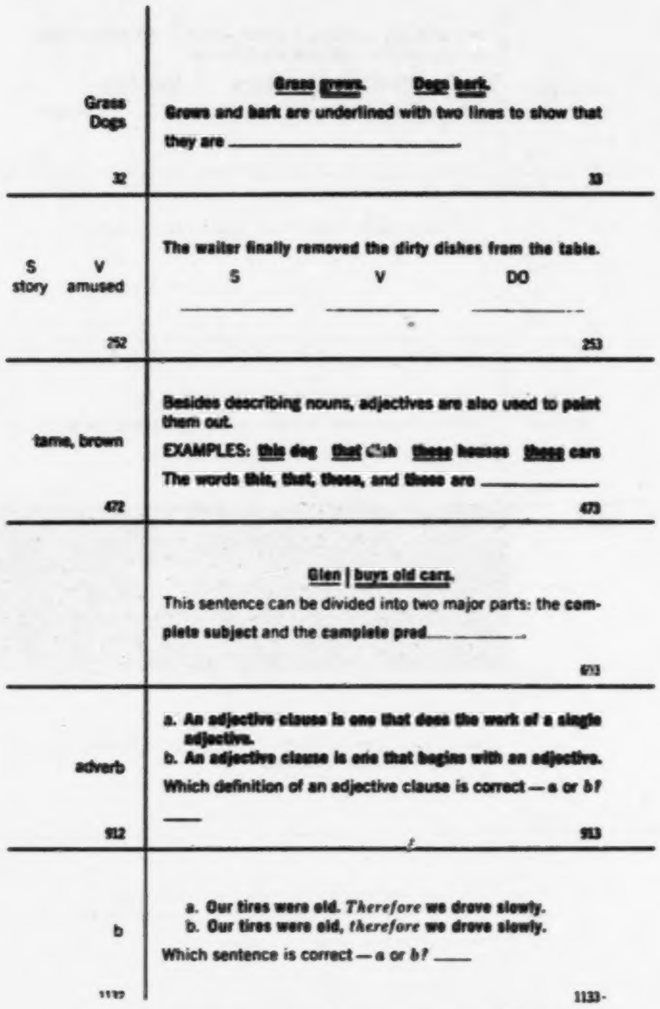
in the Revised Edition to be published in 1962.



Grass Dogs 32	**Grass grows. Dogs bark.** **Grows** and **bark** are underlined with two lines to show that they are ______________ 33
S V story amused 252	**The waiter finally removed the dirty dishes from the table.** S ________ V ________ DO ________ 253
tame, brown 472	Besides describing nouns, adjectives are also used to **point** them out. EXAMPLES: **this dog that dish these houses those cars** The words **this, that, these,** and **those** are ____________ 473
	Glen | buys old cars. This sentence can be divided into two major parts: the **complete subject** and the **complete pred**__________. 673
adverb 912	**a. An adjective clause is one that does the work of a single adjective.** **b. An adjective clause is one that begins with an adjective.** Which definition of an adjective clause is correct — *a* or *b?* ____ 913
b 1132	**a. Our tires were old.** *Therefore* **we drove slowly.** **b. Our tires were old,** *therefore* **we drove slowly.** Which sentence is correct — *a* or *b?* ____ 1133

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subject 31	In analyzing a sentence, we often underline the subject with one line and the predicate with two lines. EXAMPLES: Grass grows. Dogs bark. In the above sentences, the subjects are ____________ and ____________. 32
S DO We road 251	His funny story about the dog amused everybody. S V DO ____________ ____________ everybody. 252
adjective 471	A tame brown bear approached us. In this sentence, the two *adjectives* that modify the noun bear are ____________ and ____________. 472
adverb 691	UNIT 3: BUILDING BETTER SENTENCES Lesson 18 Recognizing Compound Sentences
false 911	If a clause can be moved from one position to another, it is an (*adverb, adjective*) clause. 912
Yes 1131	a. Our tires were old, *therefore* we drove slowly. b. Our tires were old, and *therefore* we drove slowly. Which sentence is correct — *a* or *b*? ____ 1132

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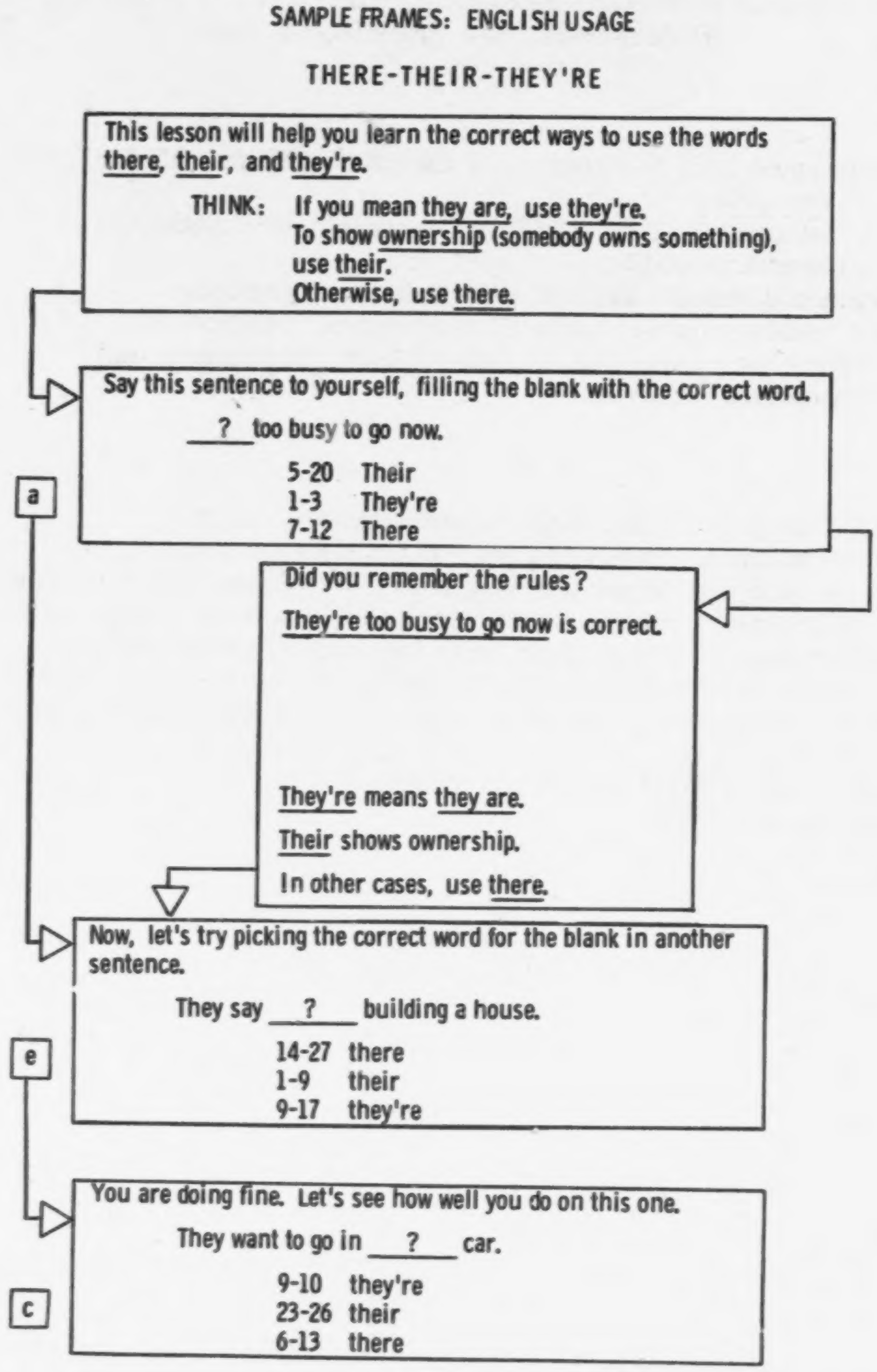
GRAMMAR & USAGE

ENGLISH USAGE Elementary
EDUCATIONAL DEVELOPMENT ASSOCIATES,
2302 J Street, Eureka, Calif.
Published by E-Z SORT SYSTEMS, Ltd.,
45 Second St., San Francisco 5, Calif.

Programed text, 600 frames, Paperback, 120 pp., 5" X 8",
"Book price"
For use in E-Z SORT SYSTEMS Instructocard method;
program reusable.
Teacher's Manual available; included with program.
Unit tests available; included in program; reusable.
Constructed Responses, Multiple Choice Responses, and
Branching all used.

INTENDED POPULATION: "Grades three to eight."
Prerequisites: "Ability to read at third grade level."
Equipment and Materials required: "Response device consisting of 15 edge-punched cards...printed educational matter published in pamphlet or text form with required student responses coded to correspond with the response device...a sorter..."
Time Required to Complete program: two weeks (based partly on data.)
Student Data being used for revision.
(one sample page)

ENGLISH USAGE
Educational Development Assoc.; E-Z SORT SYSTEMS
one sample page:



SAMPLE FRAMES: ENGLISH USAGE

THERE-THEIR-THEY'RE

This lesson will help you learn the correct ways to use the words there, their, and they're.

THINK: If you mean they are, use they're.
To show ownership (somebody owns something), use their.
Otherwise, use there.

Say this sentence to yourself, filling the blank with the correct word.

__?__ too busy to go now.

5-20 Their
1-3 They're
7-12 There

Did you remember the rules?

They're too busy to go now is correct.

They're means they are.

Their shows ownership.

In other cases, use there.

Now, let's try picking the correct word for the blank in another sentence.

They say __?__ building a house.

14-27 there
1-9 their
9-17 they're

You are doing fine. Let's see how well you do on this one.

They want to go in __?__ car.

9-10 they're
23-26 their
6-13 there

GRAMMAR & USAGE

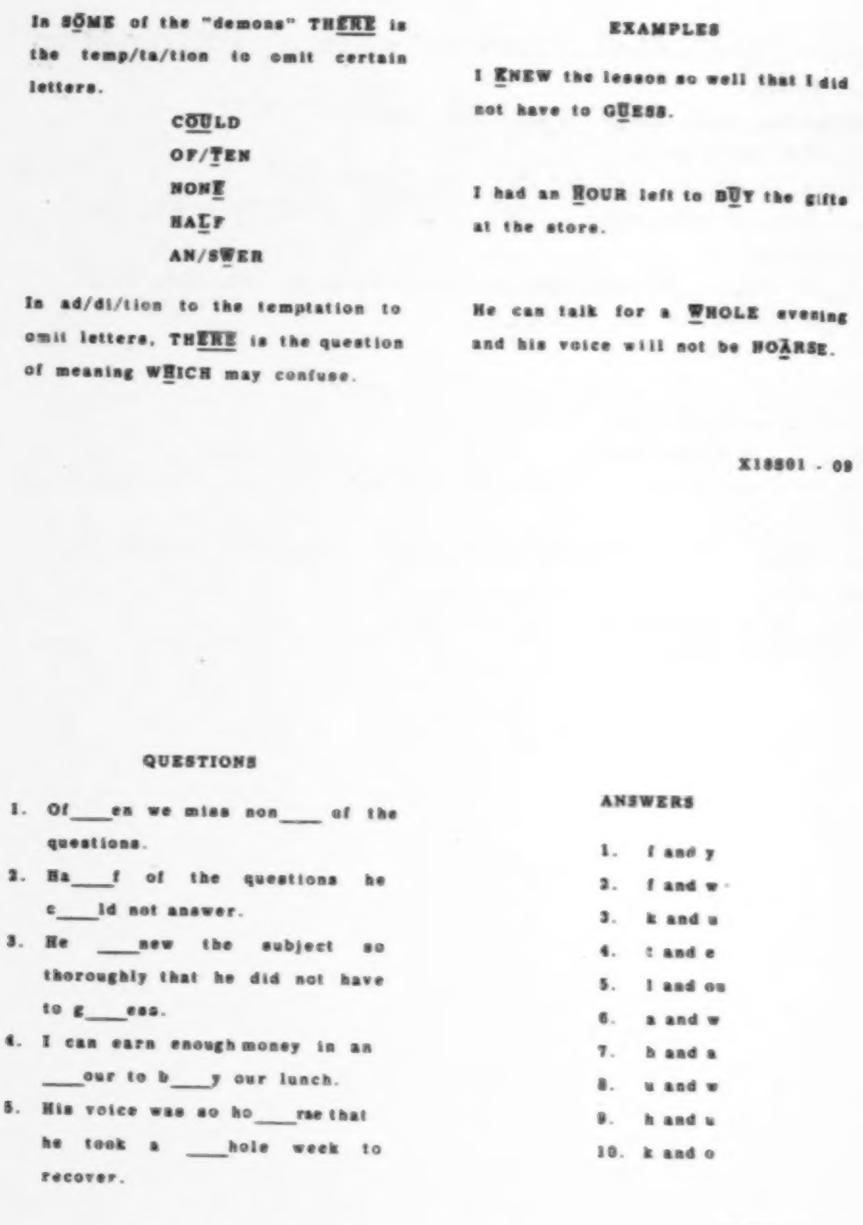
BASIC ENGLISH 37
GEORGE M. SNYDER, Programer
Published by EDUCATION ENGINEERING, Inc.,
3810 Pacific Coast Highway, Torrance, Calif.

16,200 frames for use in "SPEED" machine, $150; program reusable.
Programed text, Paperback, 540 pages, 5" X 7", 15 separate units @ $3.75 each.
Teacher's Manual available @ $4.00 per unit.
Unit, Final, Diagnostic tests available at $3.75 each; tests reusable.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

INTENDED POPULATION:
Student Prerequisites:
Additional Equipment required: "SPEED" teaching machine, $700 & $850.
Time Required to Complete program: 25 hours (based partly on data)
Student Data being used for revision.
(one sample page)

GRAMMAR & USAGE

BASIC ENGLISH 37
Snyder; EDUCATION ENGINEERING
one sample page:



In SOME of the "demons" THERE is the temp/ta/tion to omit certain letters.

COULD
OF/TEN
NONE
HALF
AN/SWER

In ad/di/tion to the temptation to omit letters, THERE is the question of meaning WHICH may confuse.

EXAMPLES

I KNEW the lesson so well that I did not have to GUESS.

I had an HOUR left to BUY the gifts at the store.

He can talk for a WHOLE evening and his voice will not be HOARSE.

X18S01 - 09

QUESTIONS

1. Of____en we miss non____ of the questions.
2. Ha____f of the questions he c____ld not answer.
3. He ____new the subject so thoroughly that he did not have to g____ess.
4. I can earn enough money in an ____our to b____y our lunch.
5. His voice was so ho____rse that he took a ____hole week to recover.

ANSWERS

1. f and y
2. f and w
3. k and u
4. t and e
5. l and ou
6. a and w
7. h and a
8. u and w
9. h and u
10. k and o

X18Q01 - 09

GRAMMAR & USAGE

ENGLISH GRAMMAR 28
GEORGE M. SNYDER, Programer
Published by EDUCATION ENGINEERING, Inc.,
3810 Pacific Coast Highway, Torrance, Calif.

6480 frames for use in "SPEED" machine, $60; program reusable.
Programed text, Paperback, 216 pages, 5" X 7",
6 separate units @ $3.75 each.
Teacher's Manual available @ $4.00 per unit.
Unit, Final, Diagnostic tests available at $3.75 each; tests reusable.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

INTENDED POPULATION:
Student Prerequisites:
Additional Equipment required: "SPEED" teaching machine, $700 & $850.
Time Required to Complete program: 12 hours (based partly on data)
Student Data being used for revision.
(two sample pages)

GRAMMAR & USAGE

ENGLISH GRAMMAR 28
Snyder; EDUCATION ENGINEERING
two sample pages:

PRONOUN

A pronoun takes the place of a noun. It is a substitute for a noun. A noun for which a pronoun stands is called an antecedent (that which goes before).

EXAMPLES

1. Jane is intelligent, but she is not pretty. Jane is the antecedent. She is the pronoun.
2. The man bought a car, but he did not like it. Man is the antecedent of he. Car is the antecedent of it.
3. Who wants a coke from the cooler? Who is the pronoun. There is no antecedent in this sentence.

Some Pronouns: I, me, you, he, him, she, her, it, we, us, they, them, who, which, that, what, this, that, these, those, all, any, both, each, none, some.

[illegible] -06

QUESTIONS

In these sentences select (p) pronoun and (a) antecedent (if any).

1. In Washington, Congress passed the bill and sent it to the president.
2. William and Mary applied for the job, but both were disappointed.
3. Who is coming to the party?
4. The tickets were bought by Steve, but he did not receive them.
5. I oppose the resolution which they proposed.

ANSWERS

1. bill (p) Washington (a)
2. I (p), which (p) resolution (a), they (p)
3. job (p) both (a)
4. who (p) party (a)
5. who (p)
6. tickets (p) Steve (a), he (p) receive (a)
7. he (p) Steve (a), them (p) tickets (a)
8. it (p) bill (a)
9. resolution (p) oppose (a)
10. both (p) William-Mary (a)

28Q1 - 06

CLAUSE

A clause is a group of words containing a subject and a predicate.

A main or independent clause can stand alone, and can express a complete thought.

A subordinate or dependent clause cannot stand alone. It depends on some other word or words in the sentence. It is always joined to the main clause in the sentence.

EXAMPLES

1. Warren pitched the tent, and Albert built the fire.

Two main clauses are joined by the coordinating conjunction and.

2. While Warren pitched the tent, Albert built the fire.

The subordinating conjunction while makes the first clause dependent. It cannot stand alone, for the first clause depends on the main clause.

28ES - 16

QUESTIONS

Select the subjects and predicates in each clause.
Indicate main (m) clauses and dependent (d) clauses.
Conjunctions are underlined.

1. Men discuss, but women gossip.
2. Nero fiddled while Rome burned.
3. In the morning the fire was burning, and the stove was smoking.
4. When Joe arrived at school, Emily was working.
5. The boy ate his dinner rapidly.

ANSWERS

1. Joe arrived (m), Emily was working (d)
2. boy ate (m)
3. dinner rapidly (m)
4. fire was burning (d), stove was smoking (m)
5. fire was burning (m), stove was smoking (m)
6. Nero fiddled (d), Rome burned (m)
7. Joe arrived (d), Emily was working (m)
8. men discuss (m), women gossip (m)
9. men discuss (m), women gossip (d)
10. Nero fiddled (m), Rome burned (d)

28QS - 16

GRAMMAR & USAGE

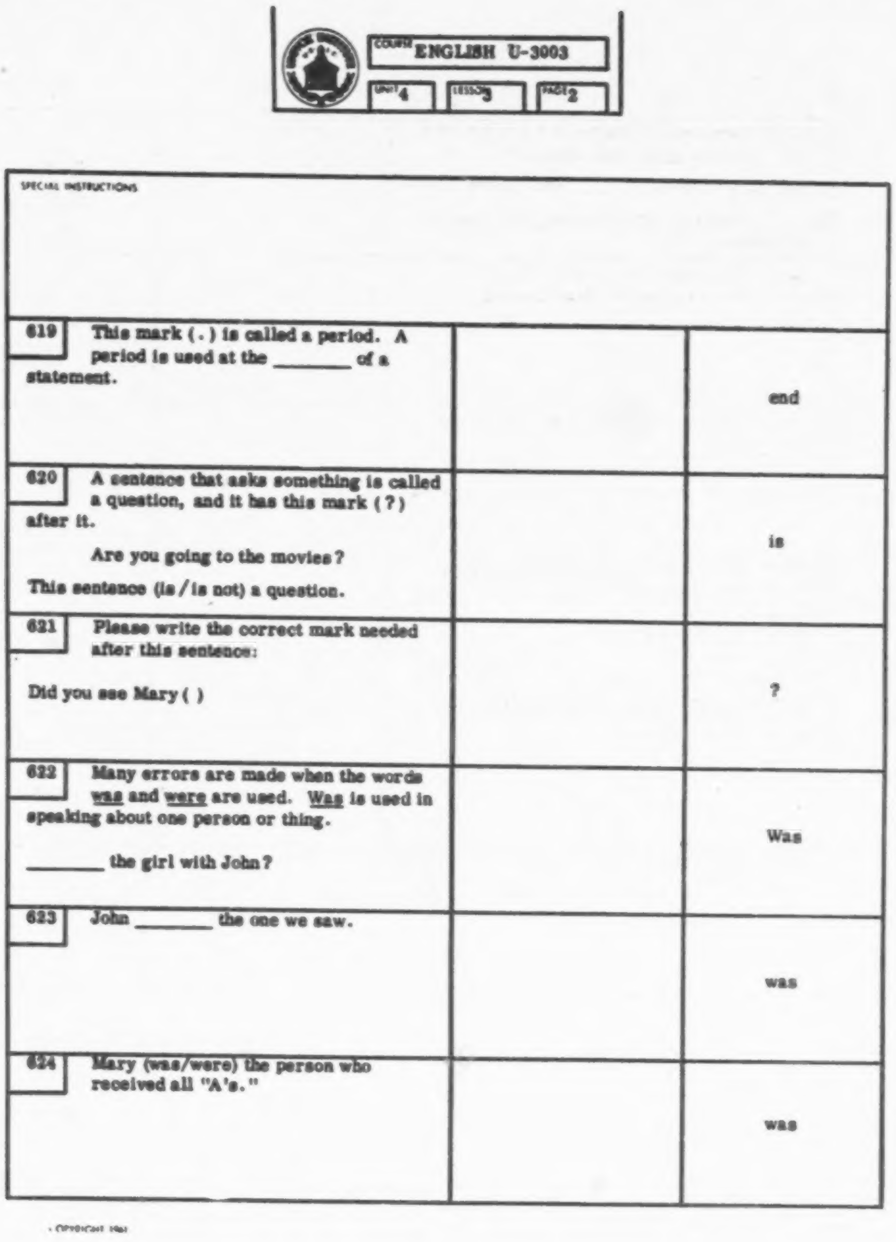
ENGLISH GRAMMAR U-3003
UNIVOX INSTITUTE, INC.
Published by UNIVERSAL ELECTRONICS LABORATORIES
CORPORATION,
510 Hudson Street, Hackensack, N. J.

Programed text, 2160 frames, Paperback, 360 pp., 8½" X 11", $14.95.
For use in Univox Model "U" Teaching Machine; program reusable.
Teacher's Manual not available.
Unit, Final, Diagnostic tests not available.
Constructed Responses usually used; some Multiple Choice used; no Branching.

INTENDED POPULATION:
No Additional Materials required.
Time Required to Complete program: "...From 28 to 34 hours" (based partly on data).
Student Data being used for revision.
(2 sample pages)

GRAMMAR & USAGE

ENGLISH GRAMMAR U-3003
Univox Institute, Inc.; UNIVERSAL ELECTRONICS
LABORATORIES
2 sample pages:



COURSE ENGLISH U-3003

UNIT 4 LESSON 3 PAGE 2

SPECIAL INSTRUCTIONS

619 This mark (.) is called a period. A period is used at the _______ of a statement.		end
620 A sentence that asks something is called a question, and it has this mark (?) after it. Are you going to the movies? This sentence (is / is not) a question.		is
621 Please write the correct mark needed after this sentence: Did you see Mary ( )		?
622 Many errors are made when the words was and were are used. Was is used in speaking about one person or thing. _______ the girl with John?		Was
623 John _______ the one we saw.		was
624 Mary (was/were) the person who received all "A's."		was

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637 Come sometimes needs a helping word, such as have, has, or had. How many children _______ come to the park? What helping word does come need in this sentence?		have have
638 Mary (has/have) come to find leaves. Write the correct helping word.		has
639 The children (have/has) come to the woods.		have
640 A word that does not need a helping word is came. She _______ to the party.		came
641 October (came/come) with red and yellow leaves.		came
642 Sometimes (come/came) needs a helping word.		come

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GRAMMAR & USAGE

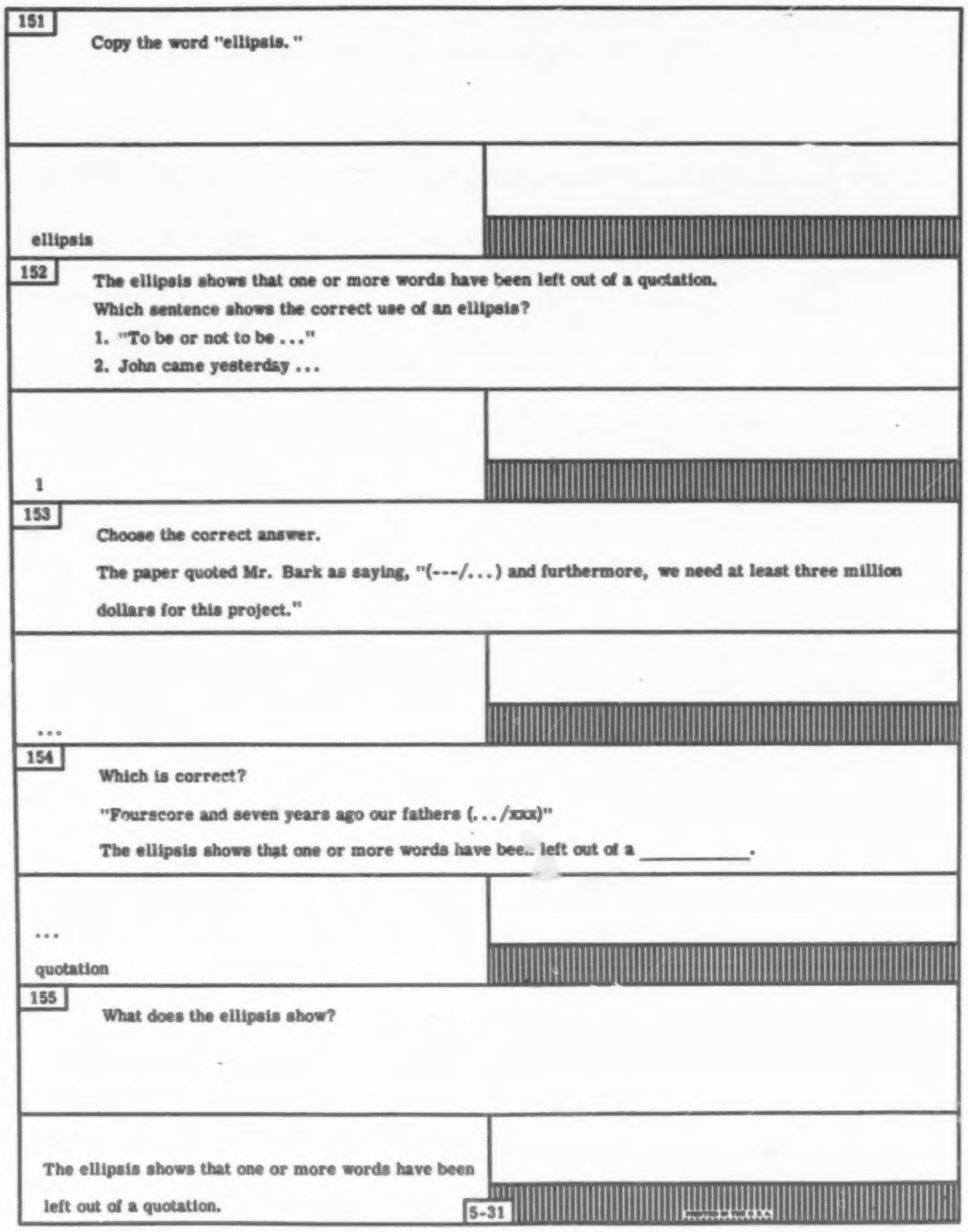
MODERN ENGLISH SERIES: PUNCTUATION — Junior High - College +
NAN CHAKERIAN,
JO ANN WHITE,
POLO C. de BACA, Programers, TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 1178 frames, Vinyl cover, 8½" X 11", 236 pp., $7.50.
For use in Min/Max, Min/Max II machines; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration.
"No tests available other than those enclosed with course,"; not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "7th grade through college."
Prerequisites: ·
No Additional Material required.
Time Required to Complete program: 8 to 12 hours (based solely on data).
Student Data being used for revision.
(one sample page)

GRAMMAR & USAGE

MODERN ENGLISH SERIES: PUNCTUATION
Chakerian, White, de Baca; TMI-GROLIER
one sample page:



151

Copy the word "ellipsis."

ellipsis

152

The ellipsis shows that one or more words have been left out of a quotation.
Which sentence shows the correct use of an ellipsis?
1. "To be or not to be . . ."
2. John came yesterday . . .

1

153

Choose the correct answer.

The paper quoted Mr. Bark as saying, "(---/. . .) and furthermore, we need at least three million dollars for this project."

. . .

154

Which is correct?

"Fourscore and seven years ago our fathers (. . . /xxx)"

The ellipsis shows that one or more words have been left out of a ___________.

. . .
quotation

155

What does the ellipsis show?

The ellipsis shows that one or more words have been left out of a quotation.

5-31

GRAMMAR & USAGE

USING PUNCTUATION Elementary Grades
EDUCATIONAL DEVELOPMENT ASSOCIATES,
2302 J St., Eureka, Calif.
Published by E-Z SORT SYSTEMS, Ltd.,
45 Second St., San Francisco 5, Calif.

Programed text, 600 frames, Paperback, 170 pp., 5" X 8",
"Book price"
For use in E-Z SORT SYSTEMS Instructocard method;
program reusable.
Teacher's Manual Available: included with program.
Unit tests available; included in program; reusable.
Constructed and Multiple Choice Responses used;
no Branching

INTENDED POPULATION: "Elementary school students."
Prerequisites: "Can read at third grade level."
Equipment and Materials required: "Response device consisting of 15 edge-punched cards...printed educational matter published in pamphlet or text book form with required student responses coded to correspond with the response device...a sorter..."
Time Required to Complete program: Two weeks (based partly on data.)
Student Data being used for revision.
(one sample page)

GRAMMAR & USAGE

USING PUNCTUATION
Educational Development Assoc.; E-Z SORT SYSTEMS
one sample page:

SAMPLE FRAMES: USING PUNCTUATION

Sometimes, when we speak directly to a person, we use that person's name: George, are you coming?

Notice ___?___ after the word George.

6-8 the comma

6-9 the exclamation point

Look at the following sentence: Where did you go, Sally?

Notice the ______ before the word Sally.
6-12

Look at the following sentence: Say, Tom, what are you doing?

Notice the ______ on each side of the word Tom.
16-28

Which rule fits these three examples?

7-8 When you speak directly to a person and use his name, always put a comma on each side of his name.

7-9 When you speak directly to a person and use his name, you should use a comma or commas to separate his name from the rest of the sentence.

2

GRAMMAR & USAGE

USING CAPITAL LETTERS Elementary
EDUCATIONAL DEVELOPMENT ASSOCIATES,
2302 J Street, Eureka , Calif.
Published by E-Z SORT SYSTEMS, Ltd.,
45 Second St., San Francisco 6, Calif.

Programed text, 300 frames, Paperback, 70 pp., 5" X 8",
"Book price"
For use in E-Z SORT SYSTEMS Instructocard method;
program reusable.
Teacher's Manual available; included with program.
Unit tests available, included in program; reusable.
Constructed Responses and Multiple Choice Responses used;
no Branching.

INTENDED POPULATION: "Elementary school students."
Prerequisites: "Can read at third grade level."
Equipment & Materials required: "A response device consisting of 15 edge-punched cards...printed educational matter published in pamphlet or text form with required student responses coded to correspond with the response device...a sorter..."
Time Required to Complete program: one week (based partly on data.)
Student Data being used for revision.
(one sample page)

GRAMMAR & USAGE

USING CAPITAL LETTERS

Educational Development Assoc., E-Z SORT SYSTEMS
one sample page:

SAMPLE FRAMES: USING CAPITAL LETTERS

The name of any school subject that comes from the name of a country should be capitalized. Look at this sentence: He is taking a course in french. In this sentence, should the word french be capitalized?

1-3 Yes

1-5 No

The word French comes from the name of the country, France. Therefore, ___?___

2-4 the word French should be capitalized.

2-5 the word French should not be capitalized.

The sentence should look like this: ___?___

3-[illegible] He is taking a course in french.

3-5 He is taking a course in French.

Is it true that the name of any school subject should be capitalized?

4-8 Yes

4-9 No

Which statement is true?

5-8 The name of any school subject that comes from the name of a country should be capitalized.

5-9 The name of any school subject should be capitalized.

GRAMMAR & USAGE

PUNCTUATION & CAPITALIZATION 26 Jr. H.S. +

GEORGE M. SNYDER, Programer
Published by EDUCATION ENGINEERING, Inc.,
3810 Pacific Coast Highway, Torrance, Calif.

3240 frames for use in "SPEED" machine, $30; program reusable.
Programed text, Paperback, 108 pages, 5" X 7",
3 separate units @ $3.75 each.
Teacher's Manual available @ $4.00 per unit.
Unit, Final, Diagnostic Tests available at $3.75 each; tests reusable.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

INTENDED POPULATION:
Student Prerequisites:
Additional Equipment required: "SPEED" teaching machine, $700 & $850.
Time Required to Complete program: 5 hours (based partly on data)
Student Data being used for revision.
(one sample page)

GRAMMAR & USAGE

PUNCTUATION & CAPITALIZATION 26

Snyder; EDUCATION ENGINEERING
one sample page:

THE APOSTROPHE (')

The apostrophe is a clever invention used to compress words into one word.
The apostrophe indicates contractions. To contract means to reduce in length.

EXAMPLES

does not = doesn't
did not = didn't
do not = don't
can not = can't
he is = he's

I will = I'll
it is = it's
there is = there's
they are = they're
who is = who's

WARNING

Do not use an apostrophe with the possessive pronouns or with WHOSE.

ours
yours
theirs

its
his
hers

EXAMPLES

Whose book is this? It is his book, not hers. The money is not theirs to keep. It is yours. The dog wagging its tail is ours.

X26[illegible]02 - 04

QUESTIONS

Is the usage underlined right or wrong?
R = Right usage W = Wrong usage.

1. Its a fine car, but hes angry because its fender is dented, and it's expensive to repair.
2. I don't like his' behavior when he's in a bad mood, and he doesnt like mine.
3. Theyre coming to get money which is not their's and I cant see that its fair.
4. Whose coming to see if there's a defect in its construction that cant be removed.
5. Its not yours and it's not ours.

ANSWERS

1. W R R W
2. R R R R
3. R W W R
4. W W W W
5. R W R W
6. W W R R
7. W W W R
8. W R R R
9. R R R W
10. R W W W

X26Q02 - 04

GRAMMAR & USAGE

400 SPELLING DEMONS BY FITZGERALD
ASTRA PROGRAMMING STAFF
Published by ASTRA CORPORATION,
31 Church Street, New London, Conn.

Pack of cards (400 frames), 8½" X 11", in Cardboard Boxes, $6.00.
For use in AUTOSCORE machine; program reusable.
Available in separate units.
Teacher's Manual available.
Unit, Final, Diagnostic tests available.
Multiple Choice always used; no Constructed Responses or Branching.

INTENDED POPULATION:
Prerequisites:
Additional Equipment required: AUTOSCORE.
Time Required to Complete program: (no data available)
Student Data being used for revision.
(one sample page)

GRAMMAR & USAGE

400 SPELLING DEMONS BY FITZGERALD
Astra Programming Staff; ASTRA
one sample page:

AUTOSCORE ASTRA CORPORATION 31 CHURCH STREET NEW LONDON, CONNECTICUT Serial No. 8

1. He banged his fist on the table for ______	--- --- affect effect ---
2. Banging on the table did not ______ the hecklers.	--- --- affect effect ---
3. Banging on the table did not ______ the absolute silence that was necessary.	effect --- affect --- ---
4. Rest and sunshine had a favorable ______ on his health.	--- effect --- affect ---
5. Rest and sunshine ______ him.	effected --- --- --- affected
6. Rest and sunshine ______ his complete cure.	--- --- effected affected ---
7. This law has many secondary ______.	effects --- affects --- ---
8. The marriage was ______ by his long absence	--- effected --- affected ---
9. After a three year engagement, she finally gave in and the marriage was ______.	--- --- affected --- effected
10. You simply cannot ______ the enemy with your shouting.	--- affect --- effect ---

Copyright 1961 - ASTRA Corp., New London, Conn. (MJJB)

GRAMMAR & USAGE

BEGINNING SPELLING — Primary Grades
EDUCATIONAL DEVELOPMENT
ASSOCIATES, 2302 J Street, Eureka, Calif.
Published by E-Z SORT SYSTEMS, Ltd.,
45 Second St., San Francisco 5, Calif.

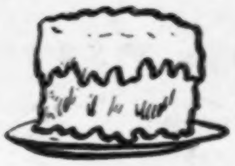
Programed text, 1500 frames, Paperback, 105 pp., 5" X 8",
"Book price"
For use in E-Z teaching machine; program reusable.
Teacher's Manual available; included with program.
Unit, Final, Diagnostic tests not available.
Constructed responses always used; no Multiple Choice and no Branching.

INTENDED POPULATION: "Primary grade students."
Prerequisites:
Equipment and Materials required: "Response device consisting of 15 edge-punched cards...printed educational matter published in pamphlet or text form with required student responses coded to correspond with the response device...a sorter..."
Time Required to Complete the program: Six months (based partly on data.)
Student Data being used for revision.
(two sample pages)

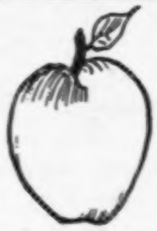
GRAMMAR & USAGE

BEGINNING SPELLING
Educational Development Assoc.; E-Z SORT SYSTEMS
two sample pages:

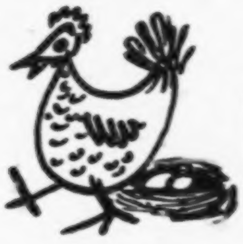
SAMPLE FRAMES: BEGINNING SPELLING



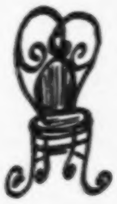
9-14	9-11	2-4	5-7



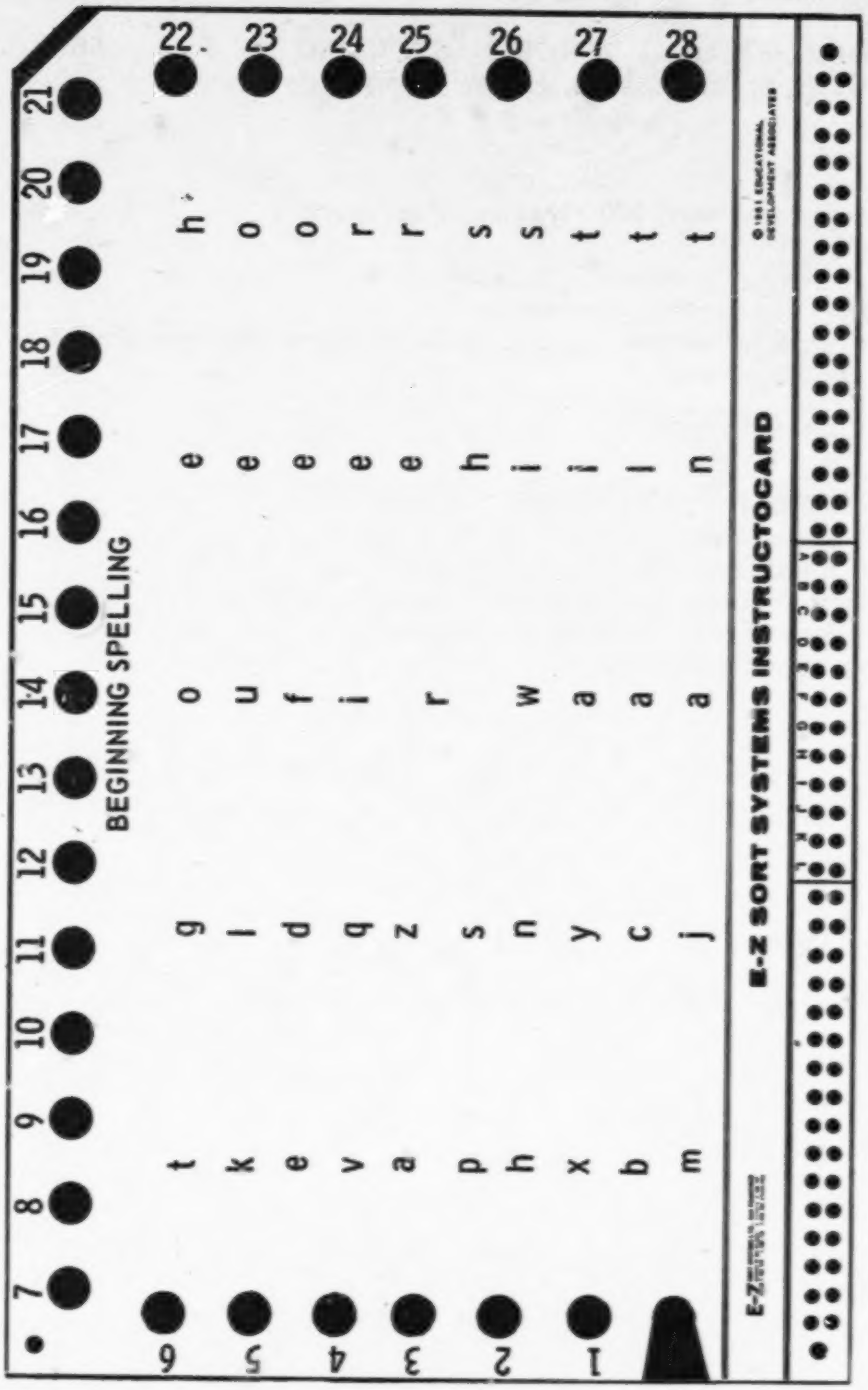
9-17	10-12	20-28	9-12	2-12



9-21	13-14	5-12	14-27	4-15	7-10	5-11



21-27	14-24	4-10	12-23	6-21



SAMPLE MASTER CARD E-Z SORT INSTRUCTOCARD TWIN-T

GRAMMAR & USAGE

YOUR PERSONAL TUTOR IN: SPELLING 6th Grade
INRAD, P.O. Box 4456, Lubbock, Texas

Programed text, 3000 frames, Paperback
$ (?)
No Teacher's Manual available.
Final test available; reusable.
Constructed Responses usually used; some Multiple Choice:
no Branching.

INTENDED POPULATION: "6th grade."
Prerequisites:
No Additional Equipment required.
Time Required to Complete program: (no data)
Student Data being used for revision.
(one sample page)

GRAMMAR & USAGE

YOUR PERSONAL TUTOR IN: SPELLING
INRAD
one sample page:

EXTRACTS FROM SPELLING PROGRAM

---

315. You read earlier that the letter "c" can spell both a hard and a soft sound. It spells a hard sound before "a", "o", and "u"; but before "e" and "i", it spells a ______ sound.

---

soft

---

316. Like "c", "g" can spell both a soft sound and a hard ________.

---

sound

---

317. Pronounce "general" and "giant". Do you hear-- (a) the soft J sound or-- (b) a hard sound? Write the vowels that follow "g".

(a)-- the soft J sound
"e"; "i"-- EITHER ORDER

---

318. Now pronounce "gab", "gob", and "gust". Do you hear-- (a) the soft J sound or-- (b) a hard sound? Write the vowels that follow "g" in each word.

(b)-- a hard sound
"a"; "o"; "u"-- ANY ORDER

GRAMMAR & USAGE

SPELLING IMPROVEMENT 13
GEORGE M. SNYDER, Programer
Published by EDUCATION ENGINEERING, Inc.,
3810 Pacific Coast Highway, Torrance, Calif.

6480 frames for use in "SPEED" machine, $60; program reusable.
Programed text, Paperback, 216 pages, 5" X 7",
6 separate units @ $3.75 each.
Teacher's Manual available @ $4.00
Unit, Final, Diagnostic Tests available at $3.75 each,
tests reusable.
Multiple Choice Responses always used; no Constructed
Responses; no Branching.

INTENDED POPULATION:
Student Prerequisites:
Additional Equipment required: "SPEED" teaching machine,
$700 & $850.
Time Required to Complete program: 8 hours (based partly
on data)
Student Data being used for revision.
(one sample page)

GRAMMAR & USAGE

SPELLING IMPROVEMENT 18
Snyder; EDUCATION ENGINEERING
one sample page:

Fifteen words from the basic list appear below. They are arranged in a way that should help you remember them.

WATCH THE DIVISIONS. WATCH THE TROUBLE SPOTS UNDERLINED.

12. adopt- a/dopt
13. afraid- a/fraid
14. agreement- a/gree/ment
15. alone- a/lone
16. along- a/long
17. amount- a/mount

NOTICE THE DIVISION BETWEEN DOUBLE CONSONANTS (dd, ff, ll).

18. address-ad/dress
19. affair- af/fair
20. allow- al/low

ONLY ONE L IN THESE WORDS

21. almost- al/most
22. already- al/ready
23. although- al/though (ugh!)
24. always- al/ways

"ALL RIGHT" IS ALWAYS TWO WORDS

25. all right

18S02- 03

QUESTIONS

Which words are misspelled?

1. (a) addopt (b) adopt (c) affair (d) affare (e) adres (f) address
2. (a) afraid (b) affraid (c) alow (d) agrement (e) aggrement (f) agreement
3. (a) alone (b) allmost (c) along (d) alon (e) allready (f) already
4. (a) amont (b) amuont (c) amount (d) although (e) allthough (f) al-through
5. (a) allways (b) always (c) all-weighs (d) alrite (e) alright (f) all right

ANSWERS

1. a b d e
2. b c d e
3. b d e
4. a b e f
5. a b d
6. a d e
7. c d e
8. c d e f
9. a c d e
10. a d f

18Q02- 02

GRAMMAR & USAGE

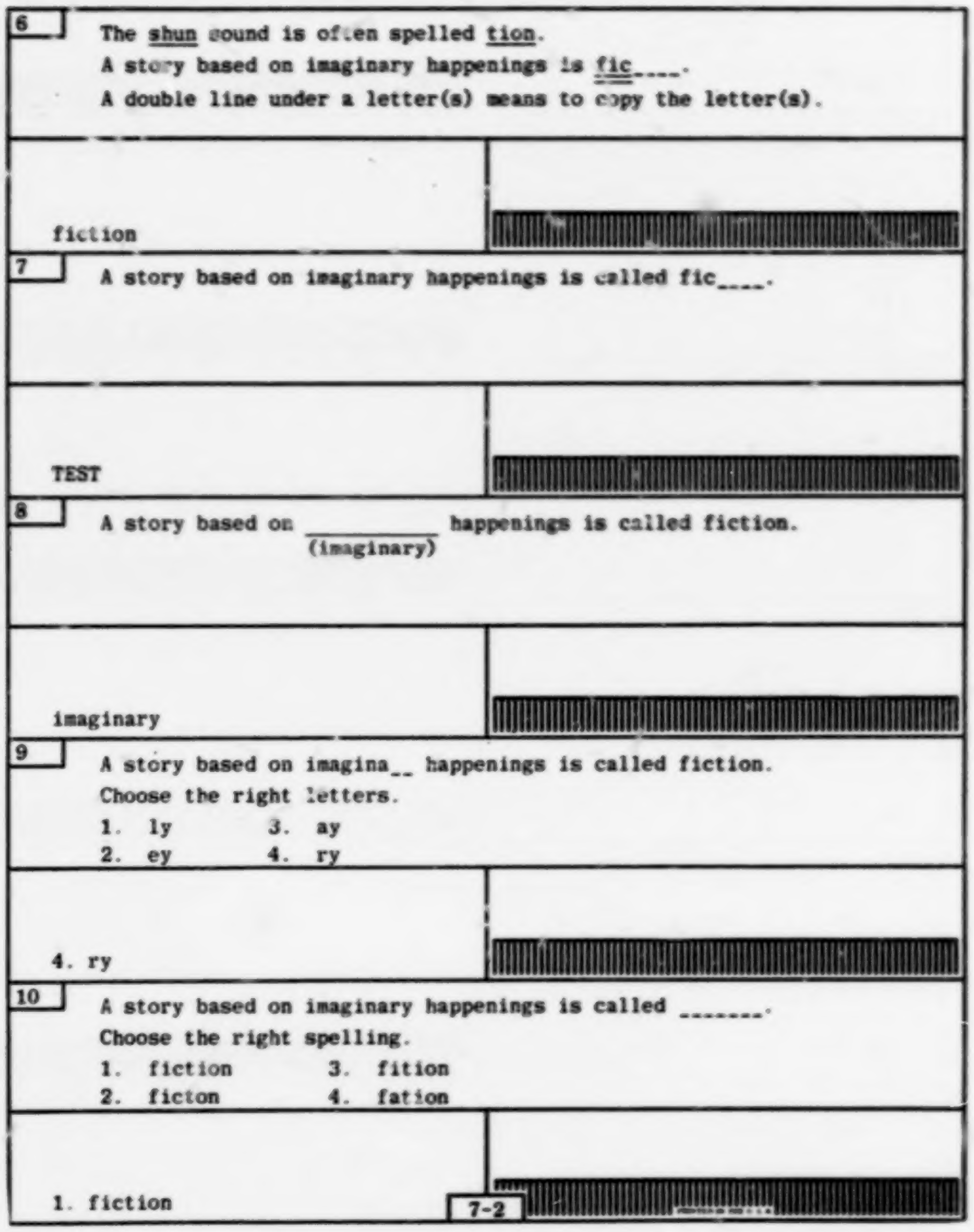
MODERN ENGLISH SERIES: 3rd grade +
SPELLING (H.S. and College REMEDIAL)
DONALD T. TOSTI,
ROGER ADDISON,
SALLY BEIMBORN, Programers; TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 3000 frames, Vinyl cover, 8½" X 11", 620 pp., $12.50.
For use in Min/Max, Min/Max II machines; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
"No tests available other than those enclosed with course," not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "3rd grade up, with remedial use for high-school and college students."
Prerequisites: "Third-grade reading skill."
No Additional Material required.
Time Required to Complete program: 12 to 24 hours (based solely on data.)
Student Data being used for revision.
(3 sample pages)

GRAMMAR & USAGE

MODERN ENGLISH SERIES: SPELLING
Tosti, Addison, Beimborn; TMI-GROLIER
3 sample pages:



6

The shun sound is often spelled tion.
A story based on imaginary happenings is fic____.
A double line under a letter(s) means to copy the letter(s).

fiction

7

A story based on imaginary happenings is called fic____.

TEST

8

A story based on __________ happenings is called fiction.
(imaginary)

imaginary

9

A story based on imagina__ happenings is called fiction.
Choose the right letters.
1. ly 3. ay
2. ey 4. ry

4. ry

10

A story based on imaginary happenings is called _______.
Choose the right spelling.
1. fiction 3. fition
2. ficton 4. fation

1. fiction

7-2

116 _______ means shy.

Bashful

117 A camera takes pictures. John takes pictures with his new ______.

camera

118 A came__ takes pictures.

ra

119 A ca____ takes pictures. Choose the right letters.

1. mrea
2. mera

2. mera

120 A ______ takes pictures.

camera

9-24

31

When a line is placed over a vowel, it shows that it has the ________ vowel sound.

long

32

The word bring comes ________ the word bottle in the dictionary.

TEST

33

When you add ed to ________, you get flapped.

flap

34

Prehaps means maybe. Find the misspelled word and spell it correctly. ________

Perhaps

35

When words have the same letter at the beginning, like job and jump, they are put in the order of their ________ letter.

second

11-7

GRAMMAR & USAGE

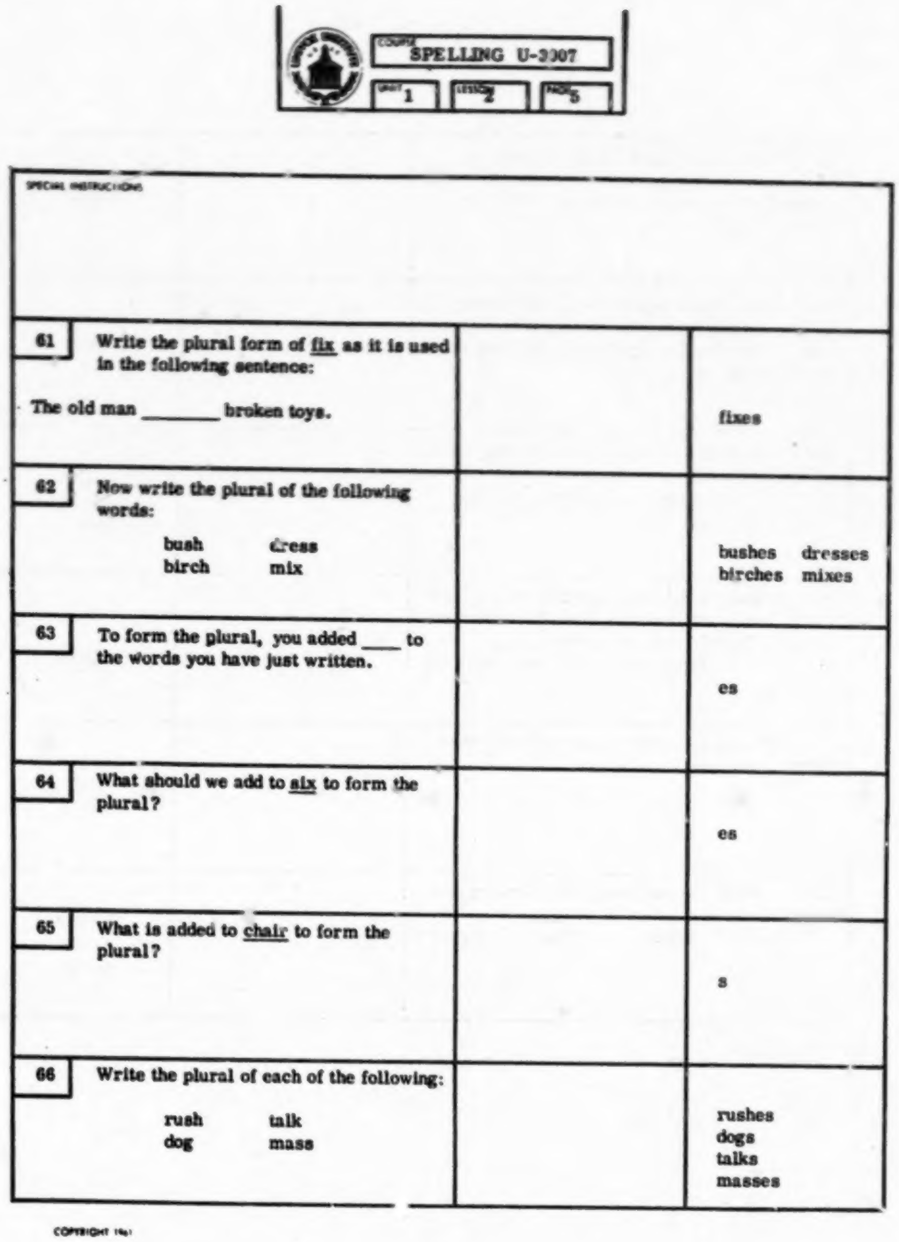
SPELLING U-3007
UNIVOX INSTITUTE INC.
Published by UNIVERSAL ELECTRONICS LABORATORIES
CORPORATION,
510 Hudson Street, Hackensack, N. J.

Programed text, 2160 frames, Paperback, 360 pp., 8½" X 11", $14.95.
Teacher's Manual not available.
Unit, Final, Diagnostic tests not available.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION:
Prerequisites:
No Additional Material required.
Time Required to Complete program: "24 to 28 hours" (based partly on data).
Student Data being used for revision.
(two sample pages)

GRAMMAR & USAGE

SPELLING U-3007
Univox Institute Inc.; UNIVERSAL ELECTRONICS LABORATORIES
two sample pages:



COURSE SPELLING U-3007
UNIT 1
LESSON 2
PAGE 5

SPECIAL INSTRUCTIONS

61	Write the plural form of fix as it is used in the following sentence: The old man _______ broken toys.		fixes
62	Now write the plural of the following words: bush dress birch mix		bushes dresses birches mixes
63	To form the plural, you added ____ to the words you have just written.		es
64	What should we add to six to form the plural?		es
65	What is added to chair to form the plural?		s
66	Write the plural of each of the following: rush talk dog mass		rushes dogs talks masses

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115 Since you hear a v when you say the plural of leaf, it must be formed by changing the f to v and adding es. Write the plural of leaf.		leaves
116 Words that end in f or fe and rhyme usually form their plurals in the same way. If the plural of knife is knives, then the plural of wife is _______.		wives
117 Write the plurals of the following words: wife knife life		wives knives lives
118 What is the letter you hear before the s when you say the plural of belief? You form the plural, then, by adding _______, as in the sentence: Different religions have different _______.		f s beliefs
119 Form two other words that will rhyme with belief. ch _ _ _ gr _ _ _		chief grief
120 Write the plurals for the following words: belief chief grief		beliefs chiefs griefs

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LANGUAGE ARTS

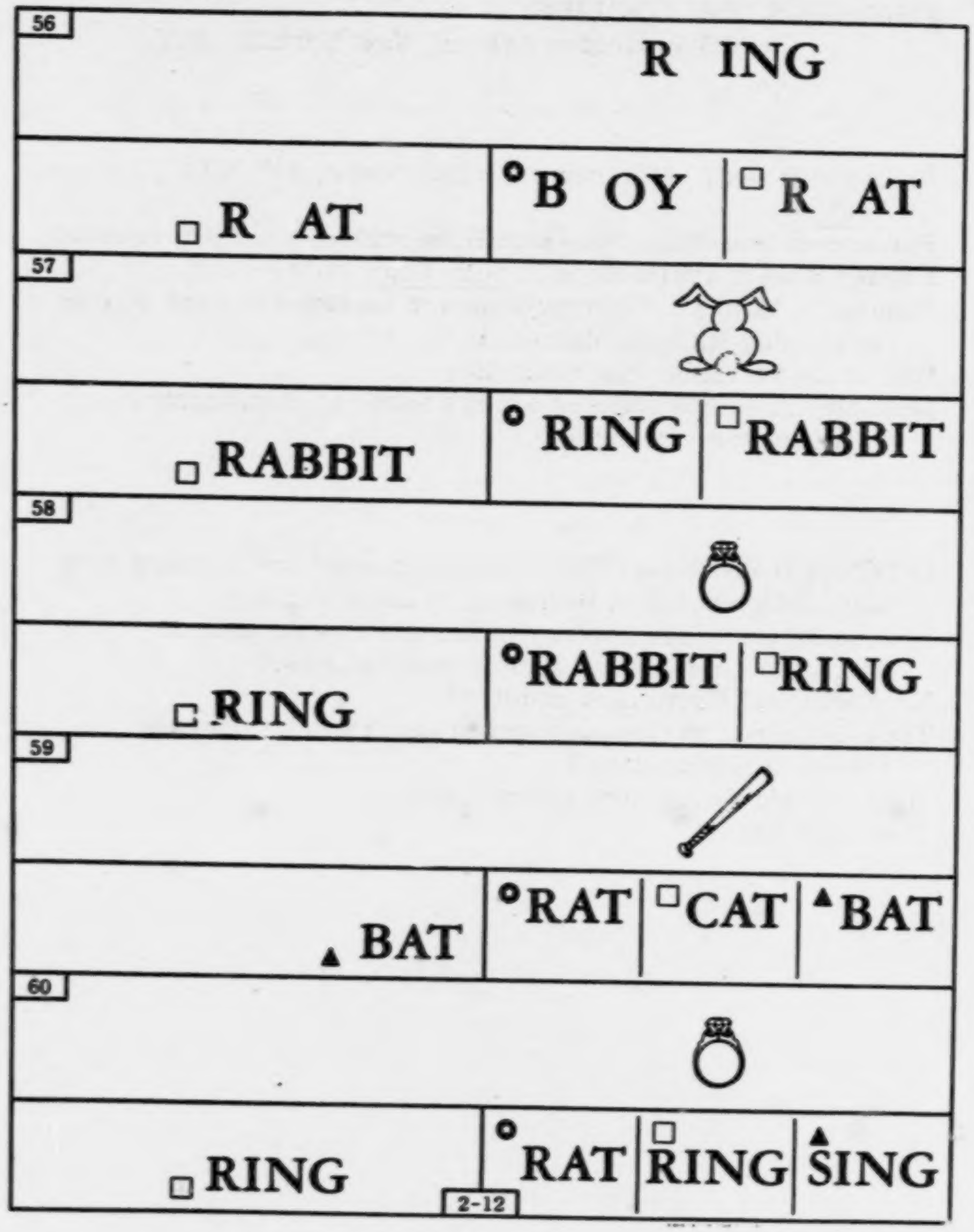
MODERN ENGLISH SERIES: Elementary ++
REMEDIAL READING
PAT ANDREGO,
POLO C. de BACA,
JOHN FULLILOVE,
THEODORE STRANCZEK, Programers; TMI;
L. BENJAMIN WYCKOFF, Asst. Professor of Psychology, Emory University
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 2500 frames, Vinyl cover, 8½" X 11", 500 pp., $ (?) .
For use in Min/Max, Min/Max II machines; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
Unit tests available; not reusable.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

INTENDED POPULATION: "Recommended for students who have deficiencies in beginning reading skills.
Prerequisites: "Elementary motor skills with pencil. Ability to comprehend simple instructions."
No Additional Equipment required.
Time Required to Complete program: 15 to 35 hours (based solely on data.)
Student Data being used for revision.
(2 sample pages)

LANGUAGE ARTS

MODERN ENGLISH SERIES:
REMEDIAL READING
Andrego, de Baca, Fullilove, Stranczek, Wyckoff; TMI-GROLIER
2 sample pages:



56

R ING

□ R AT

○ B OY | □ R AT

57

□ RABBIT

○ RING | □ RABBIT

58

□ RING

○ RABBIT | □ RING

59

▲ BAT

○ RAT | □ CAT | ▲ BAT

60

□ RING

○ RAT | □ RING | ▲ SING

2-12

16

☐ The rabbit is in the hat.

☐ The rabbit is in the hat.

17

▲ The rabbit is in the hat.

○ The spoon is in the cup.

▲ The rabbit is in the hat.

18

The ________ is in the hat.

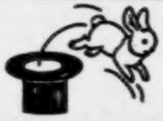
○ rabbit

○ rabbit

☐ hat

▲ spoon

19



☐ The rabbit was in the hat.

☐ The rabbit was in the hat.

20

The rabbit ____ in the hat.

☐ is

○ to

☐ is

▲ sing

9-4

PRINTED IN THE U.S.A.

LANGUAGE ARTS

REMEDIAL READING Special Education
A set of 16 Automated Workbooks
Prepared through the facilities of THE DEVEREUX FOUNDATION
Published by DEVEREUX TEACHING AIDS,
Box 717, Devon, Pennsylvania

16 Programed Workbooks, 2016 frames, Paperback, 18 pages each book, 7" X 11";
$24.50 per set.
For use in DEVEREUX TEACHING AID - MODEL 50; program reusable.
Teacher's Manual available, $1.00.
Coordinated with California Achievement Test, which includes adequate diagnostic profile.
Unit tests available; not reusable, $ (?) .
Multiple Choice Responses and Branching always used; no Constructed Responses.

INTENDED POPULATION: Special Education.
Student Prerequisites: Most booklets usable with students exhibiting specific reading disabilities though this is naturally not a requirement - neither is ability to write, so physically handicapped can and do use them.
Additional Equipment required: Model 50 Devereux Teaching Aid, $89.50.
Time Required to Complete program: Depends on IQ and nature of limitations. Many students go through the book in one hour but require several repetitions on subsequent days.
Student Data being used for revision.
(one sample page)

LANGUAGE ARTS

REMEDIAL READING
The Devereux Foundation; DEVEREUX TEACHING AIDS
one sample page:

Shellfish

No. 8

Many of us like to find seashells on the beach. Where do they all come from? They are the houses of shellfish which have been washed up on the beach by the water. Shellfish are soft little animals which live inside of these shells. They do not look like the fish we know but do have eyes, a mouth and other things like a fish. Some shellfish have a foot to help them move. Others fasten themselves to one place and stay there.

What are seashells? **little pieces of rock** **the houses of starfish** **the houses of shellfish**	**How do shellfish move?** **with feet** **with arms** **with a foot**
How do shells get on the beach? **they live there** **water washes them there** **air moves them there**	**Do all shellfish move in the water?** **yes** **no**

LANGUAGE ARTS

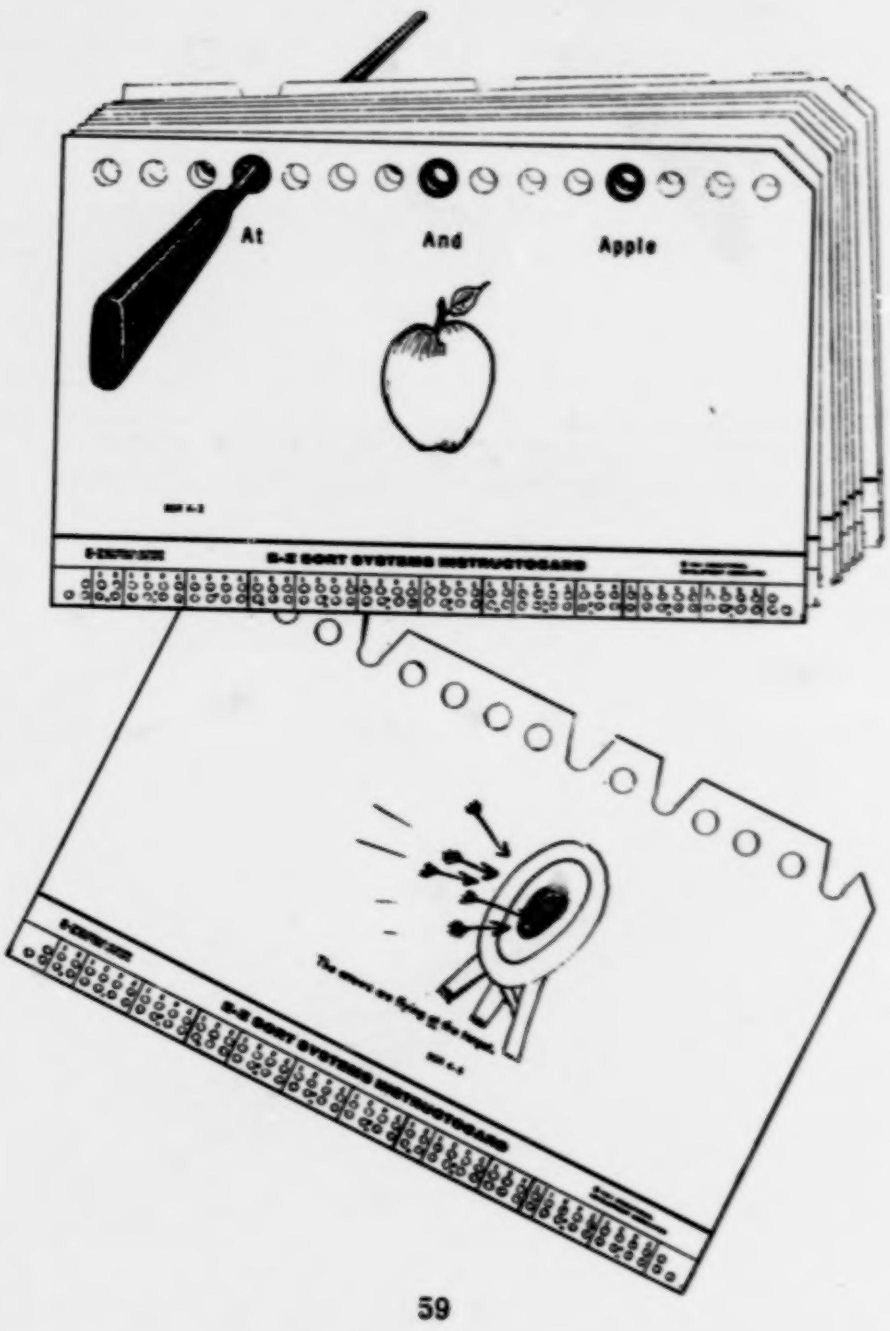
BEGINNING SIGHT VOCABULARY Primary Grades
EDUCATIONAL DEVELOPMENT ASSOCIATES,
2302 J Street, Eureka, Calif.
Published by E-Z SORT SYSTEMS, Ltd.,
45 Second St., San Francisco, Calif.

For use in E-Z Sort Systems Beginning Sight Vocabulary Teaching Machines, 945 frames in 105 "lesson" units; program reusable. $174.65.
Teacher's Manual available; included with program.
Unit Final, Diagnostic tests not available.
Multiple Choice Responses always used; no Constructed Responses and no Branching.

INTENDED POPULATION: K, 1, 2, 3.
Prerequisites:
Equipment and Materials required: E-Z SORT SYSTEMS Beginning Sight Vocabulary Teaching Machine; sorters.
Time Required to complete program: "30 hours of actual machine instruction" (based partly on data.)
Student data being used for revision.
(two sample pages)

LANGUAGE ARTS

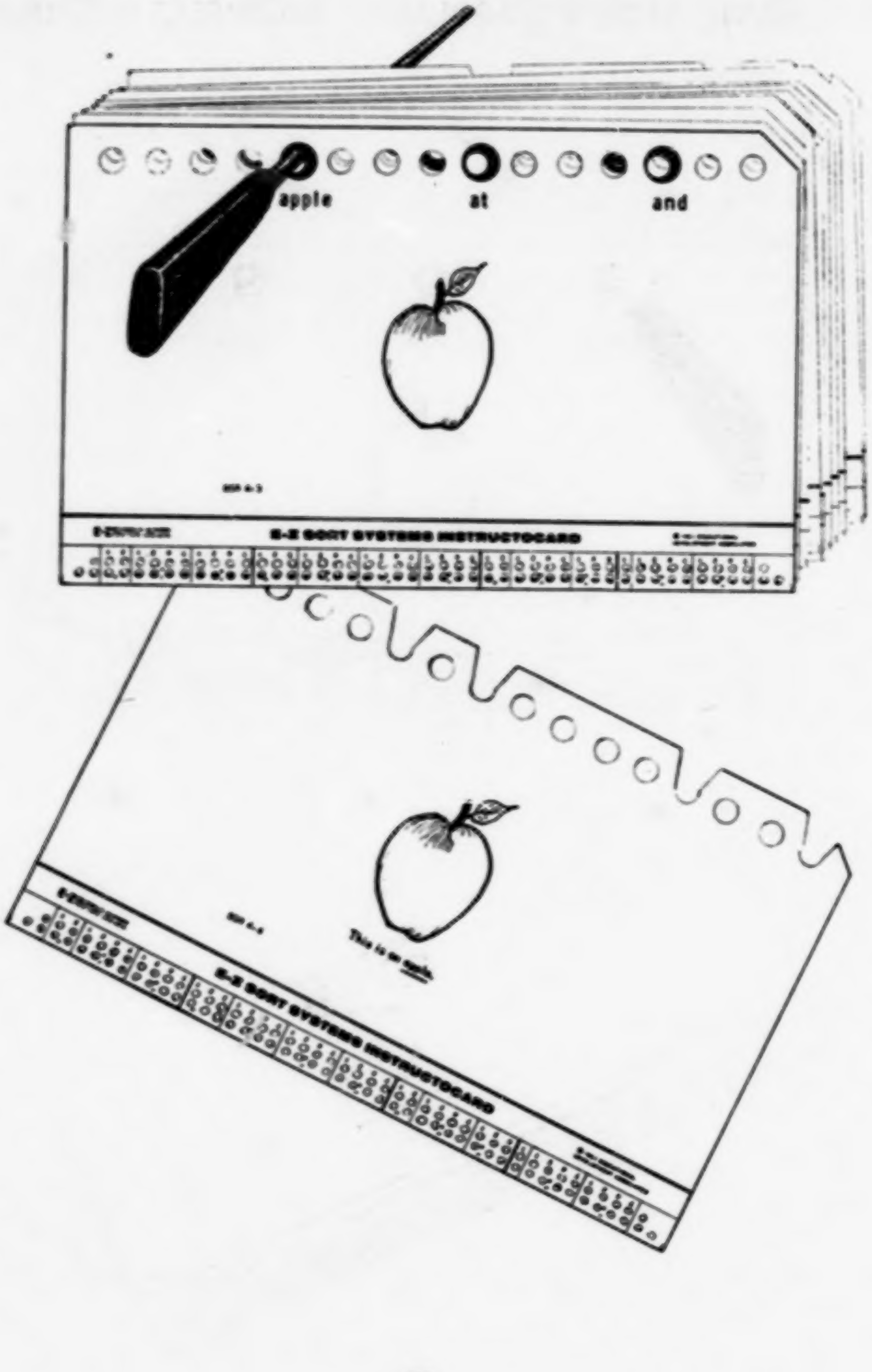
BEGINNING SIGHT VOCABULARY
Educational Development Assoc.; E-Z SORT SYSTEMS
two sample pages:



BASIC SIGHT VOCABULARY   INCORRECT RESPONSE

At
And
Apple
E-Z SORT SYSTEMS INSTRUCTOGARD
The arrows are flying at the target.
E-Z SORT SYSTEMS INSTRUCTOGARD

BASIC SIGHT VOCABULARY CORRECT RESPONSE


apple
at
and
E-Z SORT SYSTEMS INSTRUCTOCARD
This is an apple.
E-Z SORT SYSTEMS INSTRUCTOCARD

LANGUAGE ARTS

WORDS (BOOKS I, II, III, IV, V, VI) Junior - Sr. H.S.
SUSAN MEYER MARKLE,
The Center for Programed Instruction, Inc.
New York City.
Published by SCIENCE RESEARCH ASSOCIATES, Inc.,
259 East Erie Street, Chicago 11, Illinois.

Programed text, 1800 frames, Paperback, 7" X 9", 450 pp., $ (?) .
Available in 6 separate units $ (?) each.
Teacher's Manual not available.
Unit tests available.
Constructed Responses usually used; some Multiple Choice; some Branching.

INTENDED POPULATION: "Grades 7 - 12."
Prerequisites: "Average 7th grade reading ability."
No Additional Material required.
Time Required to Complete program: 20 - 30 hours (based partly on data.)
Student Data being used for revision.
(2 sample pages)

WORDS (BOOKS I, II, III, IV, V, VI)
Markle; SCIENCE RESEARCH ASSOCIATES
2 sample pages:

WORDS
BOOK I

	11.	When we add the suffix -es to a word, we add the MEANING "more than one" to the word's meaning. When we add the suffix -es to the word 'fox', we add the m_____ "more than one" to the meaning of 'fox'.
11. meaning	12.	When we subtract the suffix -s from a word, we subtract the meaning "more than one" from the word's meaning. CARS = more than one car. Subtract S, and CARS = car. When we subtract the suffix S, we subtract the ______ "more than one".
12. meaning	13.	The suffix -S has the meaning "more than one", BUT the LETTER S is not always a suffix. The word 'GAS' ends with the letter S. If you subtract the S from 'GAS', what do you have left? _ _!
13. ga	14.	So S [is--is not] a suffix in the word 'GAS'. (*choose one*)
14. is not	15.	You can make little words out of longer words as a game, but frequently you can't guess the meaning of the longer word from the little ones. The first two letters of 'BED' make a smaller word '_ _' which has nothing to do with the meaning of 'BED'.

BOOK II

	134.	For the word EXPECT, the definition that tells what the parts ex- and (s)pect mean is "___ _____".
134. look out	135.	Prefix con- Definition "?" + root tract + definition "?" contract = "___ _____"
135. pull together (or with)	136.	The definition that tells what the parts of DEPORT mean is "_____ _____".
136. carry down	137.	When we go to whole sentences, the definitions of the parts may make some rather odd sentences. Try it. "I will expel anyone who imposes on me." Translate: "I will push ___ anyone who puts extra trouble ___ my life." Not bad, so far.
137. out, into	138.	"When the pictures were juxtaposed, I agreed that one was a much better composition than the other." Translate: "When the pictures were ___ side by side, I agreed that one was a much better job of putting _______ than the other." That last one is a little odd!

BOOK III

	74.	The words DECOMPOSE and DISINTEGRATE are very close in meaning. Both of them really mean .... (Give a good definition, not a definition of the parts, this time.)
something like "fall apart" or "fall to pieces".	75.	You are building a high-fi set. You put the components together, but they don't seem to work as an integrated whole. Your high-fi set is __i______ing.
unintegrating, disintegrating	105.	"I don't feel like coming to the party because I don't feel well. Besides, I have a lot of work to get out of the way". Fill in the correct negations of 'dispose': "I am ......come to the party because I am .... Besides, I have a lot of work still ....

BOOK IV

	88.	"His views were antithetical to mine." Did he agree with me? _____
No	137.	The words ANONYMOUS and NAMELESS are (antonyms --synonyms).
synonyms	140.	The antonym of ANTONYM is ________.

LANGUAGE ARTS

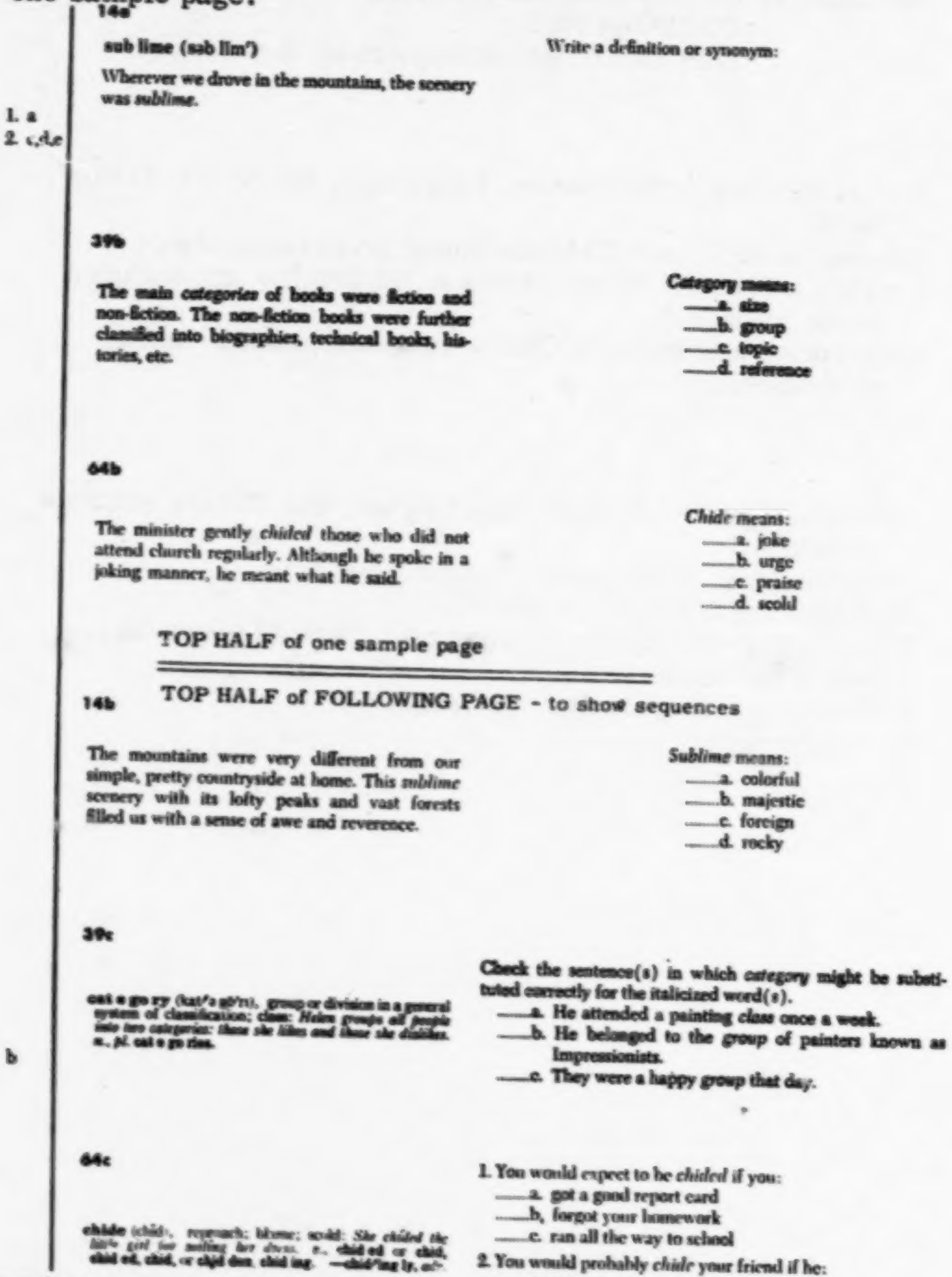
WORD CLUES (Junior - Senior High +)
Books G, H, I, J, K, L, M
STANFORD E. TAYLOR, President,
HELEN FRACKENPOHL, Executive Editor, EDL;
ARTHUR S. MACDONALD, Director Reading Services, Marquette University
Published by EDUCATIONAL DEVELOPMENTAL LABORATORIES, Inc.,
75 Prospect Street, Huntington, N.Y.

Seven programed texts, 930 frames each, Paperback, 9" X 11½", 178 pp. per book, $1.80 each
Teacher's Manual not available.
Diagnostic tests available, 25¢; not reusable.
Some Constructed Responses and some Multiple Choice Responses used; no Branching.

INTENDED POPULATION: "grades 7 - 13."
Additional Equipment required: "Not required but valuable": EDL Tach-X (filmstrip projector) $200.00; Filmstrips correlated with the books $24.00-$32.00.
Time Required to Complete program: 10 hours (based partly on data.)
Student Data being used for revision.
(one sample page)

LANGUAGE ARTS

WORD CLUES
Books G, H, I, J, K, L, M
Taylor, Frackenpohl, MacDonald; EDUCATIONAL DEVELOPMENTAL LABORATORIES
one sample page:



14a

sub lime (səb līm′)

Wherever we drove in the mountains, the scenery was *sublime.*

Write a definition or synonym:

1. a
2. c,d,e

39b

The main *categories* of books were fiction and non-fiction. The non-fiction books were further classified into biographies, technical books, histories, etc.

***Category* means:**
____a. size
____b. group
____c. topic
____d. reference

64b

The minister gently *chided* those who did not attend church regularly. Although he spoke in a joking manner, he meant what he said.

Chide means:
____a. joke
____b. urge
____c. praise
____d. scold

TOP HALF of one sample page

TOP HALF of FOLLOWING PAGE - to show sequences

14b

The mountains were very different from our simple, pretty countryside at home. This *sublime* scenery with its lofty peaks and vast forests filled us with a sense of awe and reverence.

Sublime means:
____a. colorful
____b. majestic
____c. foreign
____d. rocky

39c

cat e go ry (kat′ə gô′ri), group or division in a general system of classification; class: *Helen groups all people into two categories: those she likes and those she dislikes.* n., *pl.* **cat e go ries.**

b

Check the sentence(s) in which *category* might be substituted correctly for the italicized word(s).
____a. He attended a painting *class* once a week.
____b. He belonged to the *group* of painters known as Impressionists.
____c. They were a happy *group* that day.

64c

chide (chīd), reproach; blame; scold: *She chided the little girl for soiling her dress.* v., **chid ed** or **chid, chid ed, chid,** or **chid den, chid ing.** —**chid′ing ly,** ad

1. You would expect to be *chided* if you:
____a. got a good report card
____b, forgot your homework
____c. ran all the way to school
2. You would probably *chide* your friend if he:
____a. gave you a present
____b. forgot an appointment with you
____c. called for you

*DICTIONARY entries are taken from the Thorndike-Barnhart Advanced Junior Dictionary, courtesy Scott, Foresman, and Company.

LANGUAGE ARTS

PRINCIPLES OF DEBATE High School - College
DR. PETER PROUSE and
WAYNE T. ALCOCK, GPTC, consulting with
DR. L. S. HORMS
Published by GENERAL PROGRAMMED TEACHING
CORPORATION,
1719 Girard NE, Albuquerque, New Mexico

Programed text, 1800 frames, Paperback, $8\frac{1}{2}$" X 11", 213 pp., $4.00.
For use in GPTC and TMI machines; program reusable.
Teacher's Manual: "Instructions to the teacher are included in the preface."
Constructed and Multiple Choice Responses usually used; no Branching.

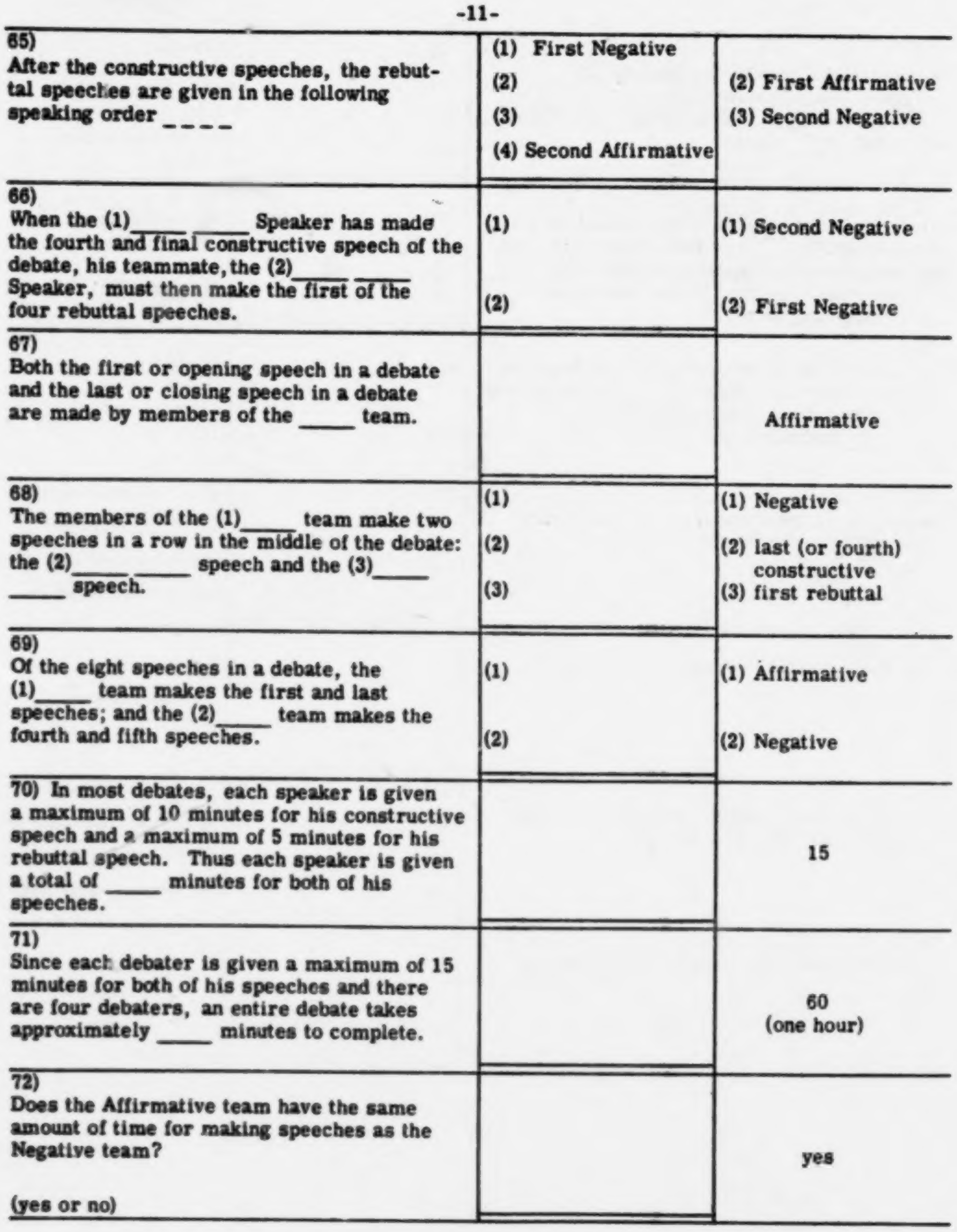
INTENDED POPULATION: "High School and College students of debate."
Prerequisites: "10th grade reading level."
No Additional Material required.
Time Required to Complete program: 18 to 22 hours (based solely on data.)
Student Data being used for revision.
(2 sample pages)

LANGUAGE ARTS

PRINCIPLES OF DEBATE

Prouse, Alcock, Horms; GENERAL PROGRAMMED TEACHING CORPORATION

2 sample pages:



-11-

65) After the constructive speeches, the rebuttal speeches are given in the following speaking order ____	(1) First Negative (2) (3) (4) Second Affirmative	(2) First Affirmative (3) Second Negative
66) When the (1)_____ _____ Speaker has made the fourth and final constructive speech of the debate, his teammate, the (2)_____ _____ Speaker, must then make the first of the four rebuttal speeches.	(1) (2)	(1) Second Negative (2) First Negative
67) Both the first or opening speech in a debate and the last or closing speech in a debate are made by members of the _____ team.		Affirmative
68) The members of the (1)_____ team make two speeches in a row in the middle of the debate: the (2)_____ _____ speech and the (3)_____ _____ speech.	(1) (2) (3)	(1) Negative (2) last (or fourth) constructive (3) first rebuttal
69) Of the eight speeches in a debate, the (1)_____ team makes the first and last speeches; and the (2)_____ team makes the fourth and fifth speeches.	(1) (2)	(1) Affirmative (2) Negative
70) In most debates, each speaker is given a maximum of 10 minutes for his constructive speech and a maximum of 5 minutes for his rebuttal speech. Thus each speaker is given a total of _____ minutes for both of his speeches.		15
71) Since each debater is given a maximum of 15 minutes for both of his speeches and there are four debaters, an entire debate takes approximately _____ minutes to complete.		60 (one hour)
72) Does the Affirmative team have the same amount of time for making speeches as the Negative team? (yes or no)		yes

80) The Affirmative team (1) ______ the proposition; the Negative team (2) ______ the proposition.	(1) (2)	(1) favors (affirms, is in favor of) (2) opposes (negates, is against)
81) A debate team usually consists of (1) ______ members; each member makes (2) ______ speeches during a debate--a (3) ______ speech and a (4) ______ speech.	(1) (2) (3) (4)	(1) two (2) two (3) constructive (4) rebuttal (3 and 4 in either order)
82) The purpose of a constructive speech is to build up or (1) ______ a team's position, and the purpose of a rebuttal speech is to (2) ______ a team's position after it has been attacked by the opposing team.	(1) (2)	(1) construct (2) rebuild
83) A constructive speech usually must be made within a time limit of (1) ______ minutes, and a rebuttal speech within a time limit of (2) ______ minutes.	(1) (2)	(1) 10 (2) 5
84) The order of the speakers when presenting constructive speeches is as follows _ _ _ _	(1) (2) (3) (4)	(1) First Affirmative (2) First Negative (3) Second Affirmative (4) Second Negative
85) The time allotted for each constructive speech is _ _ _ _		10 minutes
86) The order of the speakers when presenting rebuttal speeches is as follows _ _ _ _	(1) (2) (3) (4)	(1) First Negative (2) First Affirmative (3) Second Negative (4) Second Affirmative
87) The time allotted for each rebuttal speech is _ _ _ _		5 minutes

MODERN LANGUAGE

ELEMENTARY FRENCH High School +
MARY K. RICKERT,
BETTY LOU DUBOIS, GPTC, consulting with
DR. RAYMOND R. MacCURDY
Published by GENERAL PROGRAMMED TEACHING
CORPORATION,
1719 Girard NE, Albuquerque, New Mexico

Programed text, 2510 frames, Paperback, 8½" X 11", 502 pp., $ (?) .
For use in GPTC and TMI machines; program reusable.
Teacher's Manual: "Instructions to the teacher are included in the preface of the program."
Diagnostic - "Standardized achievement tests are available."
Constructed and Multiple Choice Responses usually used; no Branching.

INTENDED POPULATION: "High School or College."
Prerequisites: "No French prerequisites."
No Additional Material required.
Time Required to Complete program: 18 to 23 hours (based solely on data.)
Student Data being used for revision.
(2 sample pages)

MODERN LANGUAGE

ELEMENTARY FRENCH
Rickert, Dubois, MacCurdy; GENERAL PROGRAMMED TEACHING CORPORATION
2 sample pages:

---

66)

Tel before a masculine singular noun means like.

Telle before a feminine singular noun means like.

Write in French the correct form of tel before each noun.

telle mère tel père	mère pere

67)

Write in French: Like mother, like daughter.

Telle mère, telle fille.	

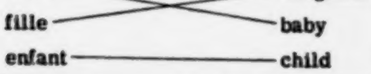
68)

Does the s of des in the phrase des garçons have a z sound?

	Répondez en anglais.
no	

69)

Match the French words with their meanings.



bébé	daughter
fille	baby
enfant	child

70)

When ne is followed by a word beginning with a vowel, it becomes n'.

	Fill in the blank.
il n' étudie pas	il ____ étudie pas

676)

When ne is followed by a word beginning with a vowel, it becomes ____.

n'	

677)

Tel is used before a masculine singular noun. ____ is used before a feminine singular noun.

telle	tel	telle

78)

The sound of e in le is [ə].

Fill in the blank.

Le is pronounced [lə].	Le is pronounced [ ].

79)

Le before a masculine noun means the. Write the (before masculine noun) in French.

le	

80)

Is étudier a regular first conjugation verb?

Répondez en anglais.

yes	

MODERN LANGUAGE

GERMAN A

DR. ERNEST E. ELLERT, Programing staff,
Britannica Center for Studies in
Learning and Motivation
Published by ENCYCLOPAEDIA BRITANNICA FILMS, Inc.,
1150 Wilmette Ave., Wilmette, Ill.

Programed text, 5050 frames, Paperback, 8½" X 11", 1,936 pp., $148.75.
For use in KONCEPT-O-GRAPH machine; program reusable.
Teacher's Manual not available.
Unit, Final, Diagnostic tests not available.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION:
Prerequisites: None.
Additional Equipment required: twelve 7" tapes (requiring 23 hours), included in price above.
Time Required to Complete program: 60 to 75 hours (based partly on data).
Student Data being used for revision.
(5 sample pages)

MODERN LANGUAGE

GERMAN A
Ellert; ENCYCLOPAEDIA BRITANNICA FILMS
5 sample pages:

1.

The words of a language are combinations of sounds. When you speak English, you use English sounds. When you speak German, you will use German ....

---

sounds

2.

German and English are related languages. Thus they have many similar sounds. But they also have some ... sounds.

---

different

3.

The sounds of English are divided into two groups: vowels and consonants. The sounds of German are also divided into ... and ....

---

vowels, consonants

4.

We use the letters of the alphabet to represent English sounds. We will use the same letters to represent German vowels that we do to represent English ....

---

vowels

But these letters ... (will/will not) always represent the same sounds that they do in English.

---

will not

5.

For a German speaker, many of your English vowels are really diphthongs, or combinations of several sounds. If you use these vowels in German, you will seem to be drawling your words, because the pure German vowels contain only one sound. For this same reason many German vowels will seem much shorter to you than similar English ....

---

vowels

6.

You will learn first to recognize and then to pronounce and to write a German vowel. You will see that it differs from the nearest English ....

---

vowel

7.

You will now hear an English vowel and a German vowel. This set of vowels will then be repeated. ★

Is the German vowel number 1 or number 2?

____

(Remember to depress your foot pedal when you see a star ★.)

2

8.

You will now hear the same vowels again. Put a check after the number of the German vowel. ★

1. ________
2. ________

1. ✓

9.

You will hear the same two vowels again. This time repeat the German vowel. ★

You repeated vowel number ....

2

10.

The German vowel which you have just repeated is written a. Pronounce it again and check your pronunciation with the tape. ★

11.

A common English vowel occurs in such words as A[illegible] and APPLE. This vowel does not occur in German.

Your teacher will now pronounce first an English vowel and then the German vowel which you have just learned. Repeat only the German vowel. ★

12.

Pronounce the German vowel a. Check your pronunciation with the tape. ★

13.

Your teacher will now combine the German vowel which you just pronounced with two consonants to form a syllable. Repeat this German syllable after her. ★

14.

Your teacher will now pronounce the German syllable which you just repeated, once correctly and once incorrectly. Repeat only the correct German syllable. ★

You repeated syllable number ....

2

15.

The syllable which you just repeated is a German word which means THAT. It is written das.

Pronounce the word das; check your pronunciation with the tape. ★

16.

Listen to the tape and write the German word which you hear. ★

____

---

das =

---

that

17.

Say in German:

that

Check your answer with the tape. ★

18.

Your teacher will pronounce a new German syllable. Repeat it after her. ★

19.

Your teacher will contrast the German syllable which you just repeated with an incorrect syllable. Repeat only the correct German syllable. ★

You repeated syllable number ....

---

2

20.

The syllable which you just repeated is a German word which means WHAT. It is written was.

Pronounce the German word was; check your pronunciation with the tape. ★

---

The German "w" is always pronounced like an English ....

---

v

3. **What are you seeing?**

____

Was sehen Sie?

---

4. **Are you coming today?**

____

Kommen Sie heute?

559.

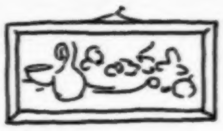
Answer in the negative. ★ +

Check your answer. ★

560.

Write the sentences which you hear under the corresponding pictures. ★

1. ________________________________ 2. ________________________________



3. ________________________________ 4. ________________________________

---

1. **Der Stuhl ist klein.**
2. **Der Tisch ist gross.**
3. **Ich sehe ein Schiff.**
4. **Das ist nicht mein Bild.**

561.

Repeat the new German word. ★

MODERN LANGUAGE

MODERN LANGUAGE SERIES: GERMAN H.S. +
WILLIAM L. VENTOLA, Jr.,
NIRAM A. WILSON, Programers, TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 3643 frames, Vinyl cover, 735 pp., 8½" X 11", $15.00.

For use in Min/Max, Min/Max II machines; program reusable.

Answer sheets available with Self-Tutor only.

Teacher's Manual: "Instructions are included in each course concerning its administration."

"No tests available other than those included with course"; not reusable.

Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "High-school age and adults."

Prerequisites: "Ability to read and follow simple instructions in English."

No Additional Materials required.

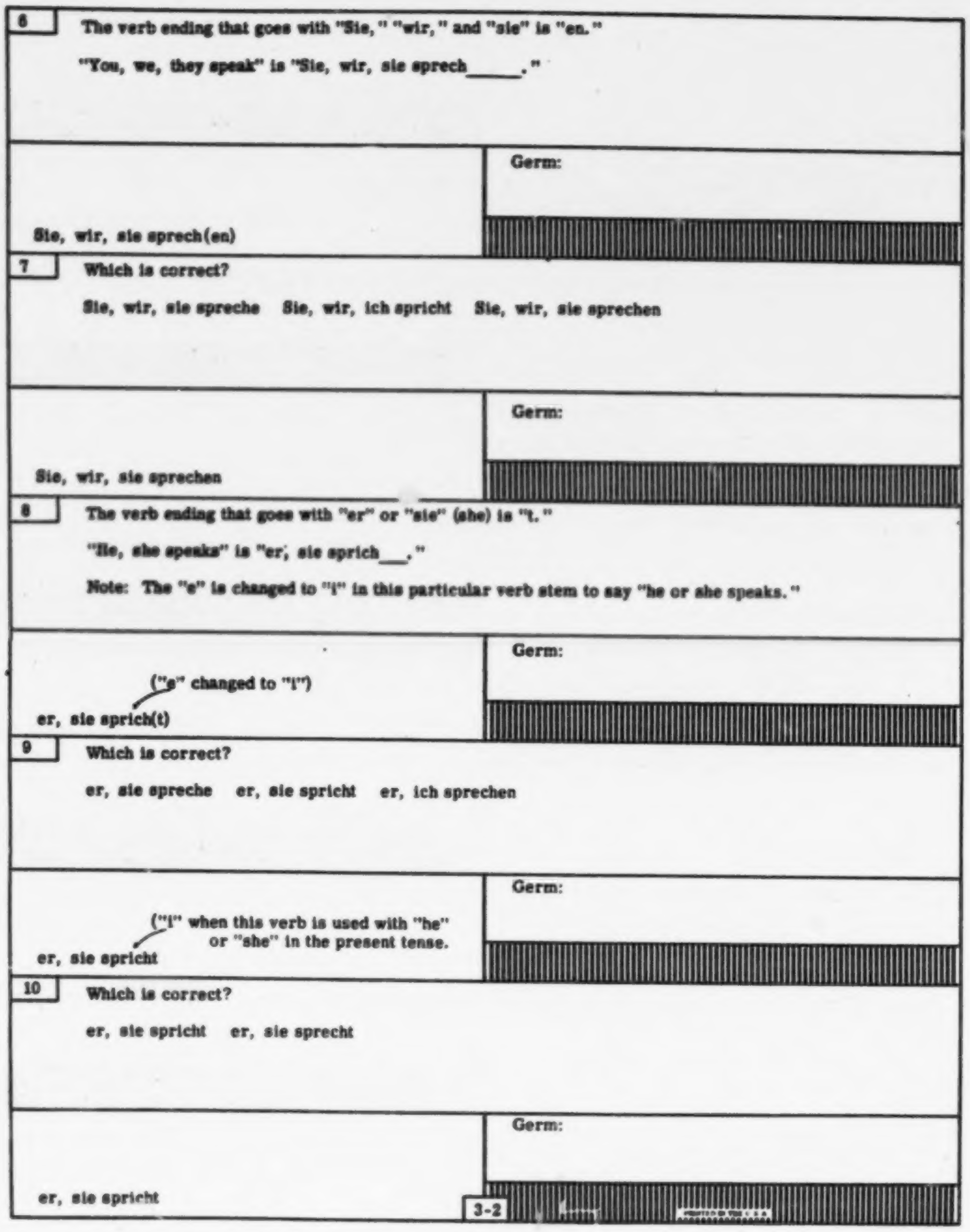
Time Required to Complete program: 17 to 30 hours (based solely on data).

Student Data *being used for revision.*

(4 sample pages)

MODERN LANGUAGE

MODERN LANGUAGE SERIES: GERMAN
Ventola, Jr., Wilson; TMI-GROLIER
4 sample pages:



6 The verb ending that goes with "Sie," "wir," and "sie" is "en."

"You, we, they speak" is "Sie, wir, sie sprech_____."

Sie, wir, sie sprech(en)

Germ:

7 Which is correct?

Sie, wir, sie spreche Sie, wir, ich spricht Sie, wir, sie sprechen

Sie, wir, sie sprechen

Germ:

8 The verb ending that goes with "er" or "sie" (she) is "t."

"He, she speaks" is "er, sie sprich___."

Note: The "e" is changed to "i" in this particular verb stem to say "he or she speaks."

("e" changed to "i")
er, sie sprich(t)

Germ:

9 Which is correct?

er, sie spreche er, sie spricht er, ich sprechen

("i" when this verb is used with "he"
or "she" in the present tense.
er, sie spricht

Germ:

10 Which is correct?

er, sie spricht er, sie sprecht

er, sie spricht

Germ:

3-2

176

German: ____________
Means : He tells (to) us.
(He tells us.)

Er sagt uns.

Germ:

177

German: Ich sage ihnen.
Sound : Ikh ZAH-geh EE-nehn.
Means : I tell (to) them.
(I tell them.)

(Copy all sentences.)

Ich sage ihnen.
Ikh ZAH-geh EE-nehn.
I tell (to) them.

Germ:
Snd :
Mns :

178

German Sound
i = ee (as in "beet")
h = silent
e = eh

The German word "ihnen" is sounded _______.

EE-nehn

Snd:

179

Which word below is the correct sound for "(to) them"?

Which word below is the correct German word for "(to) them"?

IE-nehn EE-nehn ihnen

EE-nehn ihnen

Snd :
Germ:

180

The sound of "(to) them" is "EE-nehn."

The German word for "(to) them" is _____.

ihnen

Germ:

4-36

11

German: ____________________________ ____________________

Means : 1. Give you (to) me the bread, please. 2. She brings (to) us the milk.
(Give me the bread, please.) (She is bringing us the milk.)

Germ: 1.
2.

1. Geben Sie mir das Brot, bitte.
2. Sie bringt uns die Milch.

12

Copy the sentence below which means "Where go you to"?

If no sentence below is correct, write "none."

a. Wo hin gehen sie?
b. Wo gehen Sie hin?
c. Wo Sie gehen hin?

Germ:

b. Wo gehen Sie hin?

13

German: ____________

Means : Where go you to?
(Where are you going?)

Germ:

Wo gehen Sie hin?

14

German: Wir gehen ins Kino.
Sound : Veer GAY-ehn ins KEE-noh.
Means : We go to the movie.
(We are going to the movie.)

(Copy all sentences.)

Germ:
Snd :
Mns :

Wir gehen ins Kino.
Veer GAY-ehn ins KEE-noh.
We go to the movie.

15

German		Sound
i	=	i (as in "sit")
i	=	ee (as in "beet")
o	=	oh (as the "o" in "note")

The sounds for "to the movie" are "ins KEE-noh." The words for "to the movie" are ___ ______.

Germ:

ins Kino

41 All verbs do not form the present tense by adding the endings "e," "t," or "en."

Example: 1. Ich bin = I am
2. Er ist = ___ ___
3. Wir sind = ___ ___

2. He is 3. We are

Mns: 2.
3.

42
German: Wo wohnten Sie letzten Herbst? ←
Sound : Voh VOHN-tehn zee LEHTS-tehn hehrbst? ← (Copy all sentences.)
Means : Where lived you last fall? ←
(Where did you live last fall?)

Wo wohnten Sie letzten Herbst?
Voh VOHN-tehn zee LEHTS-tehn hehrbst?
Where lived you last fall?

Germ:
Snd :
Mns :

43

German		Sound
letz	=	lehts
ten	=	tehn
e	=	eh
st	=	st (at end of word)

The sounds for "last fall" are "LEHTS-tehn hehrbst." The words for "last fall" are ____ ____.

letzten Herbst

Germ:

44
German: Wo wohnten Sie ______ ? ← (Copy German and fill in what is missing.)
Means : Where lived you last fall?
(Where did you live last fall?)

Wo wohnten Sie (letzten Herbst)?

Germ:

45
German: Wo ______ ? ← (Copy German and fill in what is missing.)
Means : Where lived you last fall?
(Where did you live last fall?)

Wo (wohnten Sie letzten Herbst)?

Germ:

13-9

MODERN LANGUAGE

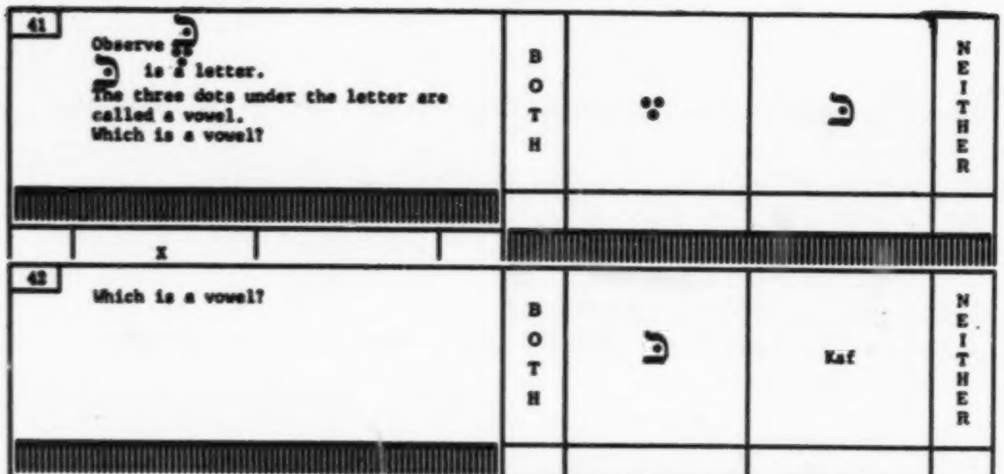
MODERN LANGUAGE SERIES: MODERN HEBREW
PAUL BLOOM,
GAYLORD SMITH, Programers; TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 1900 frames, Vinyl cover, 8½" X 11", 380 pp., $ (?) .
For use in Min/Max, Min/Max II; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration.
Unit tests available, not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION:
Prerequisites: "Required ability to read and write elementary English."
No Additional Material required.
Time Required to Complete program: 15 to 25 hours (estimated.)
Student Data being used for revision.
(2 sample pages)

MODERN LANGUAGE

MODERN LANGUAGE SERIES: MODERN HEBREW
Bloom, Smith; TMI-GROLIER
2 sample pages:



41
Observe כֶּ
כּ is a letter.
The three dots under the letter are called a vowel.
Which is a vowel?

BOTH	ֶ	כּ	NEITHER

X

42
Which is a vowel?

BOTH	כּ	Kaf	NEITHER

X

43
ֶ is a vowel that has the sound of "eh."
Kaf and ֶ have the sound of ________.
1) "keh" 2) "kah"

1) "keh"

44
Every Hebrew letter, unless it comes at the end of a word, must have a vowel.
Which example follows this rule?

BOTH	כֶּלֶב	כלב	NEITHER

X

45
Notice that under the letter כ in כֶּלֶב is the vowel ֶ
Choose the vowel.

BOTH	כ	ֶ	NEITHER

TEST

1-9

81

Which is Vet?

BOTH	ב	ל	NEITHER

X

82

Vet has the sound of the English letter:

1) l 2) k 3) eh 4) v

TEST

83

How would you pronounce בֶ?

1) "veh" 2) "leh" 3) "eh" 4) "keh"

1) "veh"

84

בֶ is pronounced "veh" because a Hebrew letter is always pronounced before the ________ that goes with it.

vowel

85

Which letter in בֶלֶב does not have a vowel?

1) ב 2) ל 3) ב

3)

1-17

Printed in U.S.A

MODERN LANGUAGE

MODERN LANGUAGE SERIES: BASIC RUSSIAN READING Jr. H.S. +
NIRAM A. WILSON,
WILLIAM L. VENTOLA, Jr.; Programers, TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

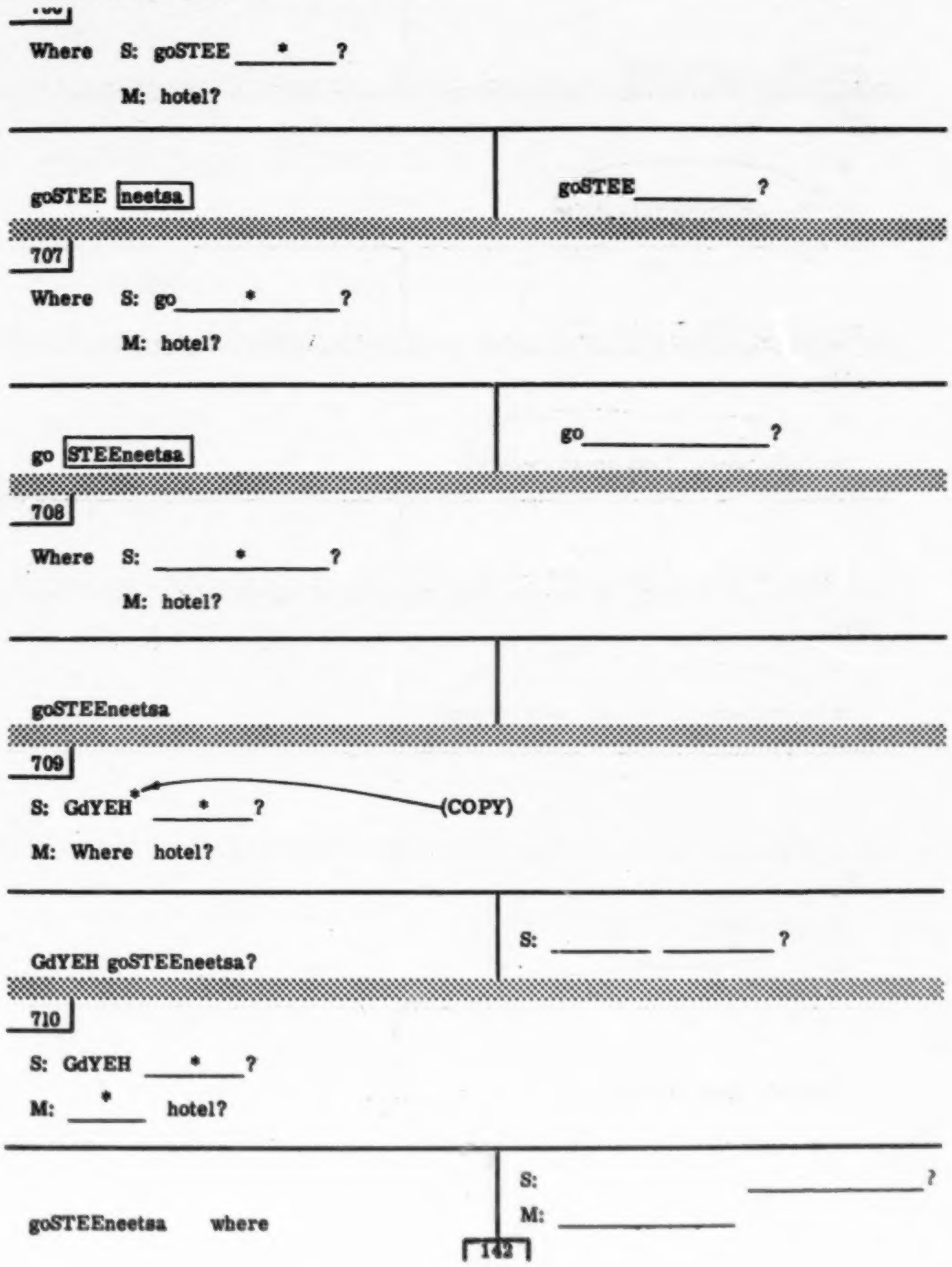
Programed text, 1994 frames, Vinyl cover, 399 pp., 8½" X 11", $10.00.
For use in Min/Max, Min/Max II machines; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
"No tests available other than those enclosed with course"; not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "Beginners of all ages from 12 years up."
Prerequisites: "Ability to read and write elementary English."
No Additional Materials required.
Time Required to Complete program: 18 to 22 hours (based solely on data).

(2 sample pages)

MODERN LANGUAGE

MODERN LANGUAGE SERIES: BASIC RUSSIAN READING
Wilson, Ventola, Jr.; TMI-GROLIER
2 sample pages:



Where S: goSTEE ____*____?
M: hotel?

goSTEE neetsa

goSTEE__________?

707

Where S: go______*_______?
M: hotel?

go STEEneetsa

go_______________?

708

Where S: _______*_______?
M: hotel?

goSTEEneetsa

709

S: GdYEH* ____*____? (COPY)
M: Where hotel?

GdYEH goSTEEneetsa?

S: ________ _________?

710

S: GdYEH ____*____?
M: ___*___ hotel?

goSTEEneetsa where

S: ______________?
M: ______________

142

1691

R:

M: Do they speak Russian?

Они говорят по-русски?

1692

R:

M: No, they speak very little.

Нет, они говорят очень мало.

1693

R:

M: I shall read. I shall read the book.

Я буду читать. Я буду читать книгу.

1694

R:

M: He will speak. He will speak Russian.

Он будет говорить. Он будет говорить по-русски.

1695

R: Они будут говорить по-русски.

M:

They will speak Russian.

339

MODERN LANGUAGE

AUTOMATED SPANISH 5th - 7th Grades
DELBERT L. BARCUS, Teacher on
Special Assignment.
Published by DENVER PUBLIC SCHOOLS,
414 Fourteenth Street, Denver, Colo.

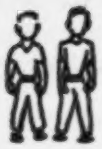
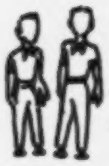
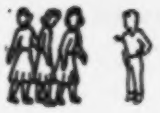
Programed Text, 2016 frames, Paperback, 291 pp., $8\frac{1}{2}$" X 11", $ (?) .
The first 672 frames also available for use in
KONCEPT-O-GRAPH machine; reusable.
Available in 3 separate units, $ (?) .
Teacher's Manual not available.
Semester and Final tests available, no diagnostic tests.
Constructed Responses always used; no Multiple Choice; no Branching.

INTENDED POPULATION: "6th Grade (Could be used for 5th or 7th)."
Prerequisites: "One year of audio-lingual Spanish."
No Additional Equipment required.
Time Required to Complete the program: 20 hours (based partly on data).
Student Data being used for revision.
(2 sample pages)

MODERN LANGUAGE

AUTOMATED SPANISH
Barcus; DENVER PUBLIC SCHOOLS
2 sample pages:

245. señora	246. Este se____ es alto y flaco.
246. señor	247. José tiene dos hermanos. Uno se llama Alberto; uno s__ ll____ Federico.
247. se llama	248. Alberto no tiene hermanas. Alberto t______ hermanos.
248. tiene	249. ¿Cuántos hermanos tiene Alberto? Alberto _____ dos hermanos.
249. tiene	250. Alberto no tiene tres hermanos; tiene sólo dos h________.
250. hermanos	251. Los h______ se llaman José y Federico.
251. hermanos	252. Hay tres niños y dos niñ___.

252. niñas	253. No hay tres niños; hay ____ niños.	
253. dos	254. ¿Tiene Alberto dos her____? Sí.	
254. hermanos	255. Hay un niño; hay tres ___s.	
255. niñas	256. ¿Cuántos n__os hay? Tres.	
256. niños	257. ¿Cuántos niños hay? H__ cuatro niños.	
257. Hay	258. ¿No hay una niña? No, hay dos n__os.	
258. niños	259. Esta ca__ tiene cuatro ventanas.	

MODERN LANGUAGE

SPANISH A
DR. STANLEY M. SAPON, Staff programer,
Britannica Center for Studies in
Learning and Motivation.
Published by ENCYCLOPAEDIA BRITANNICA FILMS, Inc.
1150 Wilmette Ave., Wilmette, Ill.

Programed text, 6602 frames, Paperback, 8½" X 11", 1,280 pp., $229.25.
For use in KONCEPT-O-GRAPH machine; program reusable.
Teacher's Manual available @ 20¢ (included in course price).
Unit, Final, Diagnostic tests not available.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION:
Prerequisites: None
Additional Equipment required: twenty-two 7" tapes (requiring 39 hours) included in price above.
Time Required to Complete program: 50 to 85 hours (based partly on data).
Student Data being used for revision.
(7 sample pages)

MODERN LANGUAGE

SPANISH A
Sapon; ENCYCLOPAEDIA BRITANNICA FILMS
7 sample pages:

20. To help you hear the difference between English sounds and Spanish sounds, you will hear an English word and then a Spanish word. Both words begin with the same consonant, but you will be able to tell which is the English and which is the Spanish word. ★○ ○

Which word was the Spanish, the first word or the second? Listen to the tape again before you mark your answer. ★○ ○

[ ] 1. [ ] 2.

20. [x] 2.

21. Here are two more words.★○ ○

Which word was the Spanish word? Listen to the tape again before you mark your answer.★○ ○

[ ] 1. [ ] 2.

21. [x] 2.

22. Here is another set of words.★○ ○

Which word was Spanish, the first or the second? Listen to the tape again before you mark your answer. ★○ ○

[ ] 1. [ ] 2.

22. [x] 2.

23. Here is another set of words. ★○ ○

Which word was Spanish, the first or the second? Listen to the tape again before you mark your answer.★○ ○

[ ] 1. [ ] 2.

23. [x] 1.

24. Here is another set of words. ★○ ○

Which word was Spanish, the first or the second? Listen to the tape again before you mark your answer.★○ ○

[ ] 1. [ ] 2.

24. [x] 2.

↑↑↑ UNIT 1 PAGE 4 ↑↑↑

Spanish A

25. Here are four words. Two of them are English, and two of them are Spanish. Listen carefully. ★○ ○ ○ ○

Which words are Spanish? Listen to the tape again before you mark your answer.
★○ ○ ○ ○
[ ] 1. [ ] 2. [ ] 3. [ ] 4.

25. [x] 3. [x] 4.

26. Here are four syllables. Two of them are English and two of them are Spanish. Listen carefully. ★○ ○ ○ ○

Which syllables are Spanish? Listen to the tape again before you mark your answer.
★○ ○ ○ ○

[ ] 1. [ ] 2. [ ] 3. [ ] 4.

26. [x] 1. [x] 3.

27. Here are four syllables. Two of them are English and two of them are Spanish.
★○ ○ ○ ○

Which syllables are Spanish? Listen to the tape again before you mark your answer. ★○ ○ ○ ○

[ ] 1. [ ] 2. [ ] 3. [ ] 4.

27. [x] 2. [x] 3.

28. Here are four more syllables. Two of them are Spanish. ★○ ○ ○ ○

Which syllables are Spanish? Listen to the tape again before you mark your answer. ★○ ○ ○ ○

[ ] 1. [ ] 2. [ ] 3. [ ] 4.

28. [x] 3. [x] 4.

29. You have learned enough about the Spanish sounds to be able to tell them apart from English sounds. Now you can practice making some Spanish sounds. Your teacher will say a Spanish syllable. He will say the syllable four times. Just listen to the first two times, and CHORUS with him the last two times. (Remember that CHORUS means that you speak at the same time as your teacher.)
★○○◉◉

30. Here is another Spanish syllable for you to chorus.★ ○○◉◉

31. Here is a Spanish syllable for you to ECHO. (Remember that ECHO means that your teacher speaks first, then you repeat aloud what he says.)★ ○ ● ○ ●

32. Here is another Spanish syllable for you to ECHO. ★ ○ ● ○ ●

33. Your teacher will say two syllables. Only one of these syllables is Spanish. ECHO only the Spanish syllable. ★ ○ ○

Which syllable did you echo? [ ] 1. [ ] 2.

33. [x] 2.

34. Here are two more syllables. One of these syllables is Spanish. ECHO only the Spanish syllable.★ ○ ○

Which syllable did you echo? [ ] 1. [ ] 2.

34. [x] 2.

35. Here are two syllables. One of these syllables is Spanish. Echo only the Spanish syllable. ★ ○ ○

Which syllable did you echo? [ ] 1. [ ] 2.

35. [x] 1.

36. Here are two syllables. One of these syllables is Spanish. Echo only the Spanish syllable. ★ ○ ○

Which syllable did you echo? [ ] 1. [ ] 2.

36. [x] 1.

37. Here are four syllables. Two of them will be Spanish. Echo only the Spanish syllables.★ ○ ○ ○ ○

Which syllables did you echo? [ ] 1. [ ] 2. [ ] 3. [ ] 4.

37. [x] 2. [x] 4.

38. Here are two Spanish syllables. Each syllable will be spoken twice. ECHO each syllable. ★ ○ ● ○ ● ★ ○ ● ○ ●

fff fff

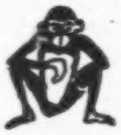
39. The two syllables you echoed in the last frame can be put together to make a Spanish word. Your teacher will say the word four times. Just listen. ★○○○○

40. Here is the word again. This time CHORUS what the teacher says. ★○○◉◉

41. Here is the word again. This time ECHO what the teacher says. ★○●○●

After you echo the word, move to the next frame, and you will see a picture of what the word means.

42.



Say aloud the word that goes with this picture.

Now check your answer with the tape, and echo the tape.

✓ ---- ★○●○●

43. You will hear two sets of syllables. There will be three English syllables, and three Spanish syllables. Listen carefully. ★○ ○ ○   ○ ○ ○

Which set of syllables is Spanish? Listen to the tape again before you mark your answer. ★○ ○ ○   ○ ○ ○

[ ] first set   [ ] second set

43. [x] second set

44. Here are two Spanish syllables. You will hear each syllable twice. Listen carefully. ★○○   ○○

Which syllable begins with the sound of th in the English word "think"? Listen to the tape again before you mark your answer. ★○○   ○○

[ ] first syllable   [ ] second syllable

44. [x] second syllable

45. Here is the syllable that begins with the sound of th in "think." You will hear it four times. Just listen to the first two times, and chorus the last two.
★○○◉◉

46. Here are four syllables. Two of them will be Spanish. Echo only the Spanish syllables.★ ○ ○ ○ ○

Which syllables did you echo? · [ ] 1. [ ] 2. [ ] 3. [ ] 4.

46. [x] 2. [x] 4.

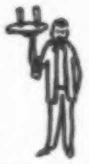
47. The two Spanish syllables you have just echoed make a word in Spanish. Your teacher will say the word four times. Listen carefully.★ ○○○○

48. Here is the word again. Chorus the last two times. ★ ○○◉◉

49. Here is the word again. Echo the tape.★ ○ ● ○ ●

Now move to the next frame, and you will see a picture of what the word means.

50.



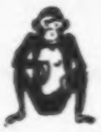
Now say the word that goes with this picture.

Check your answer with the tape and echo the tape.

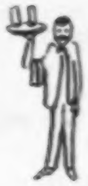
✓ ---- ★ ○ ● ○ ●

??? ???

51. Here are two pictures:



[ ]



[ ]

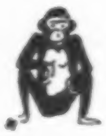
When you press the pedal, you will hear two Spanish words. Write the number 1 under the picture that matches the first word, and number 2 under the picture that matches the second word.★ ○ ○

51.

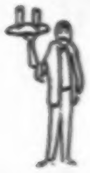
[1]

[2]

52.



[ ]



[ ]

Here are the words again. You will hear each word twice. Echo each word.
★○●○● ★○●○●

Write the number 1 under the picture of the first word you echoed, and the number 2 under the picture of the second word you echoed.

52.

[2]

[1]

53. You will hear four syllables. Two of them will be Spanish.★ ○ ○ ○ ○

Which syllables are Spanish? Listen to the tape again before you mark your answer. ★ ○ ○ ○ ○

[ ] 1. [ ] 2. [ ] 3. [ ] 4.

53. [x] 3. [x] 4.

54. Here are the four syllables again. Echo only the Spanish syllables. ★ ○ ○ ○ ○

Which syllables did you say aloud? [ ] 1. [ ] 2. [ ] 3. [ ] 4.

54. [x] 2. [x] 4.

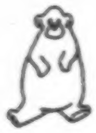
55. The two Spanish syllables you have just spoken make a word in Spanish. Your teacher will say the word four times. Listen carefully. ★ ○○○○

56. Here is the word again.★ ○○◉◉

57. Here is the word again.★ ○ ● ○ ●

Move to the next frame and you will see a picture of what the word means.

58.



Now say the word that goes with this picture.

Check your answer with the tape, and echo the tape.

✓ ---- ★ ○ ● ○ ●

↑↑↑ ↑↑↑

MODERN LANGUAGES

INTRODUCTORY SPANISH

DR. M. W. SULLIVAN, Staff programer,
Britannica Center for Studies in
Learning and Motivation
Published by ENCYCLOPAEDIA BRITANNICA FILMS, Inc.,
1150 Wilmette Ave., Wilmette, Ill.

Programed text, 3276 frames, Paperback, 8½" X 11", 1,250 pp., $84.50.
For use in KONCEPT-O-GRAPH machine; program reusable.
Teacher's Manual not available.
Unit, Final, Diagnostic tests not available.
Constructed Responses usually used; Multiple Choice Responses sometimes used; no Branching.

INTENDED POPULATION:
Prerequisites: None
Additional Equipment required: seven 7" tapes (requiring 15 hours), included in price above.
Time Required to Complete program: 40 to 45 hours (based partly on data).
Student Data being used for revision.
(3 sample pages)

MODERN LANGUAGES

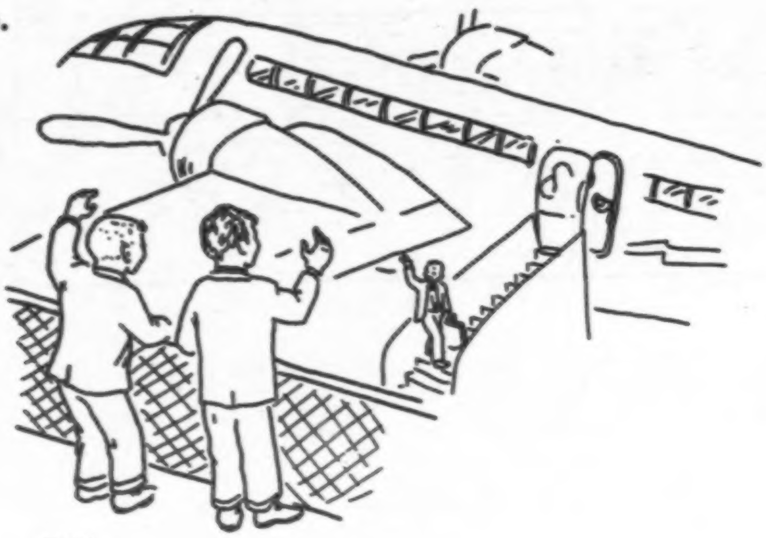
INTRODUCTORY SPANISH
Sullivan; ENCYCLOPAEDIA BRITANNICA FILMS
3 sample pages:

To form their plurals, the object pronouns add _____.

—

s

139.



Read.

El Viaje

Alberto está en el avión; va a ir a Europa.

Sus amigos Roberto y Pedro le dicen adiós y él contesta con las manos.

A Alberto le gusta viajar en vacaciones, después de sus exámenes.

Sus amigos no son ricos; no pueden ir como él a Europa.

Los billetes de avión son muy caros y sus padres necesitan el dinero para comprar cosas para comer.

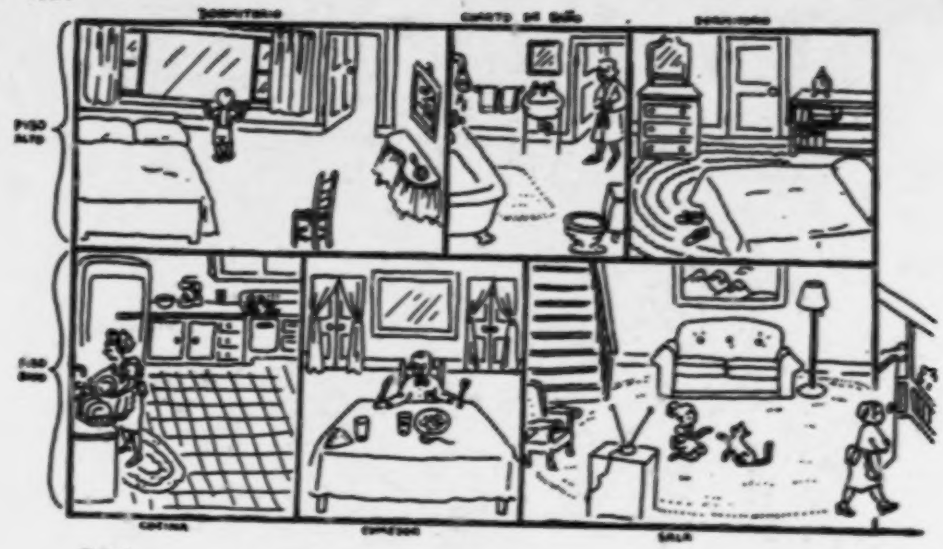
Es muy interesante viajar.

Cuando viajamos conocemos museos, teatros, nuevas personas y ciudades.

Cuando volvemos es más fácil comprender las lecciones de historia.

Contesta.*

171.



Read.

En el cuadro hay una casa. La casa tiene dos pisos; un piso alto y un piso bajo. En el piso alto hay dos dormitorios y un cuarto de baño. En el piso bajo hay una sala, un comedor y una cocina. La casa tiene seis habitaciones.

Listen to the paragraph and answer the questions.*

Llene los blancos.

habitación
piso
dormitorio
cuarto de baño
sala
comedor
cocina

bedroom ________________
floor (storey) __________
room ____________________
bathroom ______________________________

kitchen ______________
dining room ___________
living room ___________

---

dormitorio
piso
habitación
cuarto de baño

cocina
comedor
sala

3

966.

Llene los blancos.

1. La madre está siempre muy ______ en su casa.
(busy)

La madre está siempre muy ocupada en su casa.

---

2. Ella ______ las ______ de los niños todos los días.
(washes) (shirts)

Ella lava las camisas de los niños todos los días.

Contesta.*

967.

Escuche la cinta y llene el blanco.*

necesit____ = TO NEED

---

necesitar

MODERN LANGUAGE

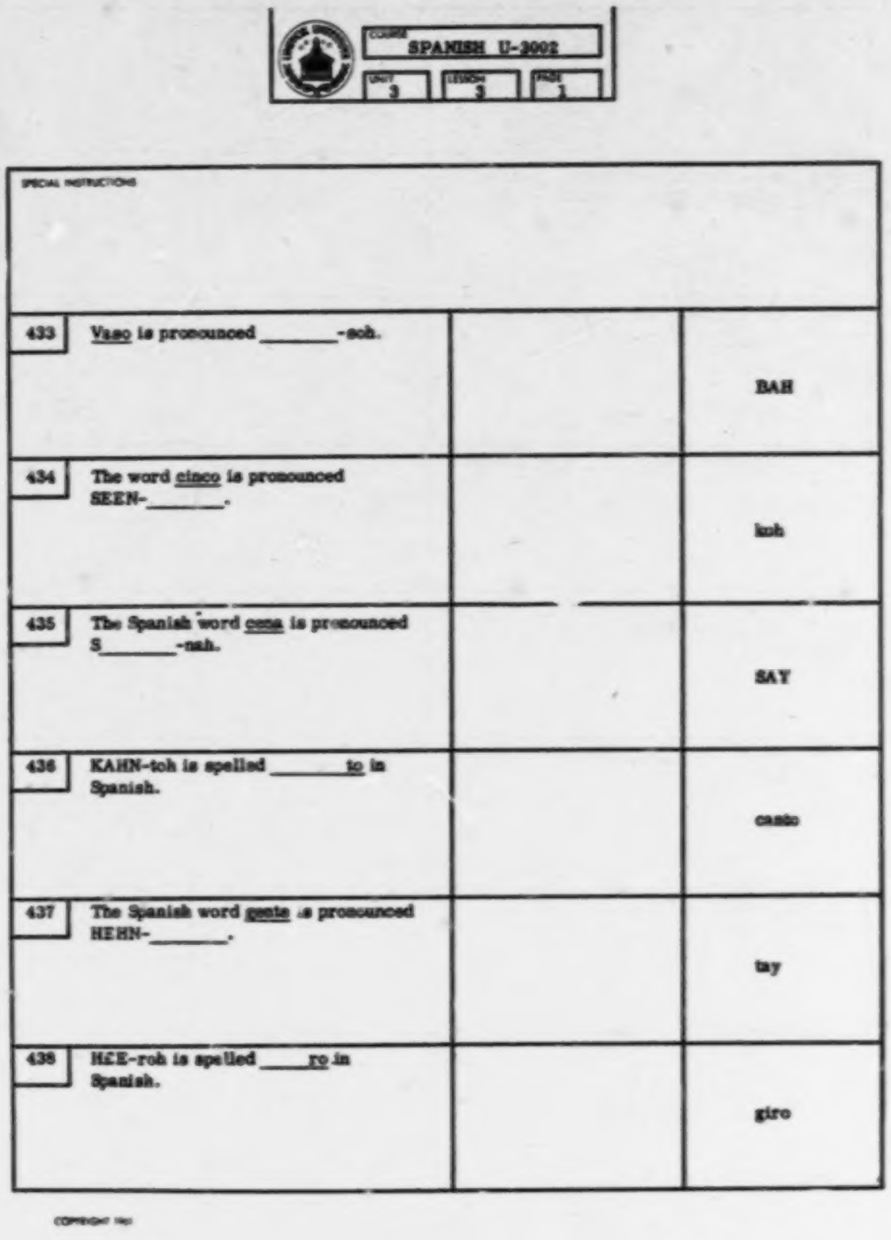
SPANISH U-3002
UNIVOX INSTITUTE, INC.
Published by UNIVERSAL ELECTRONICS
LABORATORIES CORP.,
510 Hudson Street, Hackensack, N. J.

Programed text, 2160 frames, Paperback, 360 pp., 8½" X 11", $14.95.
For use in Univox Model "U" Teaching Machine; program reusable.
Teacher's Manual not available.
Unit, Final, Diagnostic tests not available.
Constructed Responses usually used; some Multiple Choice; no Branching.

No Additional Materials required.
Time Required to Complete program: "30 to 36 hours" (based partly on data).
Student Data being used for revision.
(two sample pages)

MODERN LANGUAGE

SPANISH U-3002
Univox Institute, Inc.; UNIVERSAL ELECTRONICS LABORATORIES
two sample pages:



COURSE SPANISH U-3002

UNIT 3 LESSON 3 PAGE 1

SPECIAL INSTRUCTIONS

433	Vaso is pronounced _______-soh.		BAH
434	The word cinco is pronounced SEEN-_______.		koh
435	The Spanish word cena is pronounced S_______-nah.		SAY
436	KAHN-toh is spelled _______to in Spanish.		canto
437	The Spanish word gente is pronounced HEHN-_______.		tay
438	HEE-roh is spelled _____ro in Spanish.		giro

COPYRIGHT [illegible]

463	In the Spanish language, ____ is the masculine singular definite article.		el
464	The article el means the. El means ________ in Spanish.		the
465	The Spanish word ________ means the.		el
466	In Spanish, el libro means the book. The phrase el libro means ________ book.		the
467	The phrase ______ libro means the book.		el
468	El libro means ________ ________.		the book

MODERN LANGUAGE

MODERN LANGUAGE SERIES: BASIC SPANISH READING
NIRAM A. WILSON,
WILLIAM L. VENTOLA, Jr., Programers, TMI
Published by TMI-GROLIER,
575 Lexington Avenue,
New York 22, N.Y.

Programed text, 3400 frames, Vinyl cover, 560 pp., $8\frac{1}{2}$" X 11", $12.50.
For use in Min/Max, Min/Max II machines; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
"No tests available other than those included with course"; not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

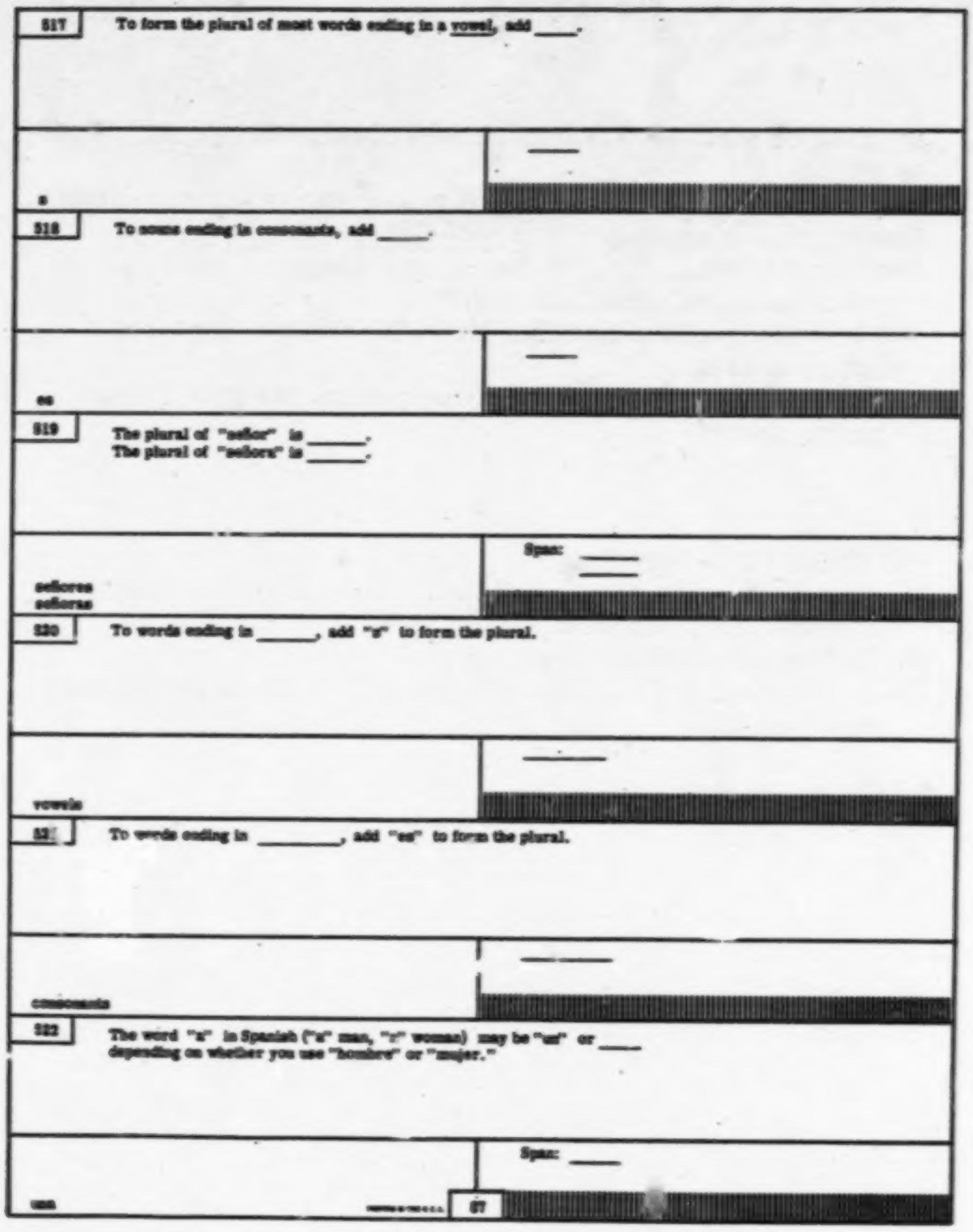
INTENDED POPULATION:
Prerequisites: "Required ability to read and follow simple instructions in English."
No Additional Material required.
Time Required to Complete program: 17 to 30 hours (based solely on data)

(3 sample pages)

MODERN LANGUAGE

MODERN LANGUAGE SERIES: BASIC SPANISH READING

Wilson, Ventola, Jr.; TMI-GROLIER
3 sample pages:



517 To form the plural of most words ending in a vowel, add ____.

s

518 To nouns ending in consonants, add _____.

es

519 The plural of "señor" is ______.
The plural of "señora" is ______.

señores
señoras

Span: ______
______

520 To words ending in ______, add "s" to form the plural.

vowels

52 To words ending in ________, add "es" to form the plural.

consonants

522 The word "a" in Spanish ("a" man, "a" woman) may be "un" or ____ depending on whether you use "hombre" or "mujer."

una

Span: _____

87

943 "To be," "to write," and "to have" are all infinitives.

"Hablar" means "to speak." "Hablar" is an _________.

infinitive

944 The "ar" in "estar" (to be) shows that "estar" is an infinitive.

The "ar" in "hablar" (to speak) shows that _________ is also an infinitive.

hablar

945 Many infinitives end in _________, such as "estar" and "hablar."

ar

946 "Hablar" is an infinitive that ends in _________.

ar

947 To form the different persons of "hablar" use the stem "habl."

We take off "ar" from "hablar" to form the s_____.

s____

s(tem)

948 "Habl" is the _____ of "hablar."

stem

3217 "Veintidós" and "veintitrés" have accent marks.

22 = ________

23 = ________

22 = veintidós
23 = veintitrés

Span: 22 = ________
23 = ________

3218 "Twenty-two" is "veintidós," (Note accent mark.)

"Twenty-three" is ________

veintitrés (Note accent.)

Span:

3219 Add the Spanish words for "one," "two," "three," "four," and "five" to "veinti" to form "21," "22," "23," "24," and "25."

21 = ________
22 = ________
23 = ________
24 = ________
25 = ________

21 = veintiuno
22 = veintidós
23 = veintitrés
24 = veinticuatro
25 = veinticinco

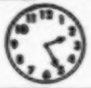
Span: 21 = ________
22 = ________
23 = ________
24 = ________
25 = ________

3220 "Twenty-four" is not "veintecuatro," but ____________.

veinticuatro

Span:

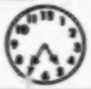
3221 ¿Qué hora es?



Son las dos y veinticinco.

Span:

3222 ¿Qué hora es?



Son las cinco menos veinticinco.

537

Span:

MATHEMATICS - ALGEBRA

High School +

ALGEBRA 11

R. CLAYTON COURSEY, Vice-President, Education Engineering, Inc.

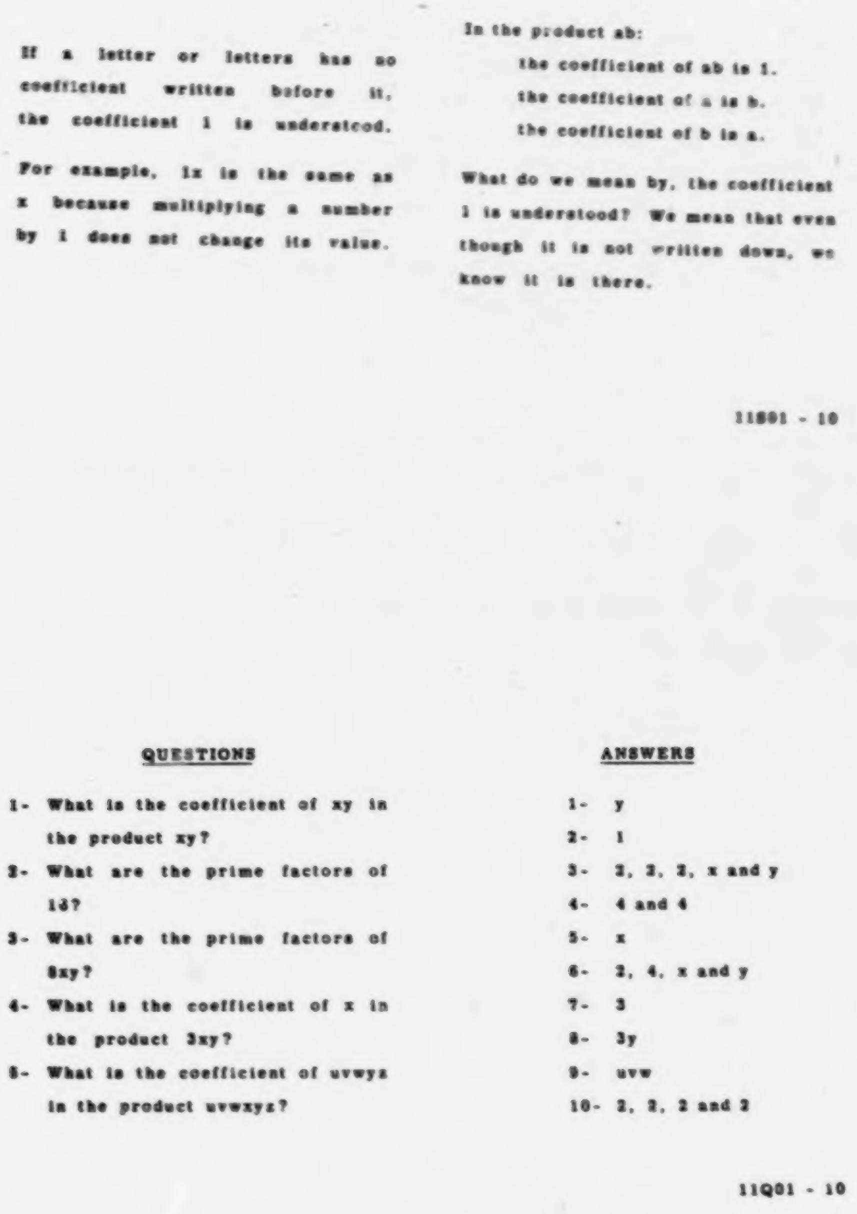
Published by EDUCATION ENGINEERING, Inc.,
3810 Pacific Coast Highway, Torrance, Calif.

15,200 frames, for use in "SPEED" machine,
$152; program reusable.
Programed text, Paperback, 540 pages, 5" X 7",
15 separate units @ $3.75 each.
Teacher's Manual available @ $4.00 per unit.
Unit, Final, Diagnostic Texts available @ $10.00.
tests reusable.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

INTENDED POPULATION:
Student Prerequisites: Arithmetic
Additional Equipment required: "SPEED" teaching machine, $700 & $850.
Time Required to Complete program: 30 hours (based partly on data.)
Student Data being used for revision.
(one sample page)

MATHEMATICS - ALGEBRA

ALGEBRA 11
Coursey; EDUCATION ENGINEERING
one sample page:



If a letter or letters has no coefficient written before it, the coefficient 1 is understood.

For example, 1x is the same as x because multiplying a number by 1 does not change its value.

In the product ab:

the coefficient of ab is 1.
the coefficient of a is b.
the coefficient of b is a.

What do we mean by, the coefficient 1 is understood? We mean that even though it is not written down, we know it is there.

11S01 - 10

QUESTIONS

1- What is the coefficient of xy in the product xy?
2- What are the prime factors of 16?
3- What are the prime factors of 8xy?
4- What is the coefficient of x in the product 3xy?
5- What is the coefficient of uvwyz in the product uvwxyz?

ANSWERS

1- y
2- 1
3- 2, 2, 2, x and y
4- 4 and 4
5- x
6- 2, 4, x and y
7- 3
8- 3y
9- uvw
10- 2, 2, 2 and 2

11Q01 - 10

MATHEMATICS - ALGEBRA

ADVENTURES IN ALGEBRA High School +
NORMAN A. CROWDER, Mgr. Training
Systems Dept. of Western Design, and
GRACE C. MARTIN, TutorText Staff Writer
Published by DOUBLEDAY AND CO., Inc.
575 Madison Avenue, New York 22, N.Y.

Programed text, Hardcover, 8 1/4" X 5 3/8", 348 pp., $4.95.
Teacher's Manual not available.
Unit, Final, Diagnostic tests not available.
Multiple Choice Responses and Branching always used; no Constructed Responses

INTENDED POPULATION: "Originally trade market, some school use possible."
Prerequisites: "varies with school and subject areas."
No Additional Material required.
Time Required to Complete program: 60 pages an hour, over 5 hours (estimated).
Student Data being used for revision.
(2 sample pages)

MATHEMATICS - ALGEBRA

ADVENTURES IN ALGEBRA
Crowder, Martin; DOUBLEDAY
2 sample pages:

TUTORTEXT - ADVENTURES IN ALGEBRA

NOTE TO THE READER

This is not an ordinary book. The pages are numbered in the usual way, but they are not read consecutively. You must follow the directions which you find at the bottom of each page.

You will find that reading this book is very much like having an individual tutor. The book will continually ask you questions and correct errors as well as give you information.

Your progress through this course will depend entirely on your ability to choose right answers instead of wrong ones - and by your endurance. The course is divided into chapters, and a number of short learning sessions produces better results than a few long ones.

Follow the instructions and you'll find it's impossible to get to the final page without mastering the fundamentals of Algebra.

CHAPTER ONE

Mathematical Truths

Mathematicians frequently are accused of speaking a language that is different from that spoken by the rest of the populace. This accusation is not entirely justified. The language of mathematics is simply ordinary speech extended to include rather unfamiliar symbols as well as words. But the sentences used by mathematicians can be analyzed into subjects and predicates, verbs and nouns, just as ordinary speech can. Since it is important for us to understand the structure of the language of mathematics if we are going to learn to speak that language, let's first be sure we understand the structure of ordinary speech.

Below you will find a multiple-choice question. Pick what you believe is the right answer to the question and turn to the page indicated after the answer you choose. The question is:

In the sentence "All women are poor drivers," which words are the subject and the verb?

All women is the subject and are poor drivers is the verb. page 5

All women is the subject and are is the verb. page 7

Poor drivers is the subject and are is the verb. page 10

5
(from page 1)

YOUR ANSWER: All women is the subject and are poor drivers is the verb.

We didn't say that the sentence "All women are poor drivers" consists of a subject and verb and nothing else. There are some words in this sentence that are neither subject nor verb, so after you have designated the subject and verb you should have some words left over.

You have divided the sentence into its subject and predicate. All women is the subject, because all women is what the sentence is about. Are poor drivers is the predicate, because this is what the sentence says about all women. Now, the verb is contained in the predicate. Here the verb is the word are. This verb is what is called a "linking" verb because it functions as a connecting link between the subject and the words that complete the thought of the sentence.

So now you know which words are the subject and the verb. Go back to page 1 and choose the correct answer.

YOUR ANSWER: All women is the subject and are is the verb.

You are correct. The sentence is about all women, so all women is the subject. The remainder of the sentence, are poor drivers, constitutes the predicate, which is that part of a sentence that says something about the subject. The verb are is called a linking verb because it serves as a connecting link between the subject and the words which complete the thought of the sentence.

Please note immediately that we haven't said anything about whether the statement "All women are poor drivers" is true. Our only point is that it is a sentence, and a sentence may be true or may be false. This is also the case with the mathematical sentences we are about to discuss.

Now let's consider a sentence in which we say something about a number--but let's say it in English, not in "mathematics." Consider the sentence "Three equals two plus one." What are the subject and verb in this sentence?

Three is the subject and equals is the verb. page 3

Three is the subject and equals and plus are verbs. page 13

Three is the subject and plus is the verb. page 16.

10
(from page 1)

YOUR ANSWER: Poor drivers is the subject and are is the verb.

The subject of a sentence is that part of it about which something is said. The sentence "All women are poor drivers" is not about poor drivers. A sentence about poor drivers would be one such as "Poor drivers are a traffic hazard," in which poor drivers is the subject. But the sentence "All women are poor drivers" is about all women, and all women is the subject of the sentence.

Now return to page 1 and choose the correct answer.

MATHEMATICS - ALGEBRA

INTRODUCTORY ALGEBRA PROGRAM High School +
IRVING DROOYAN, Chairman, and
WILLIAM WOOTON, Professor,
Dept. of Mathematics, Los Angeles Pierce College
Published by JOHN WILEY & SONS, Inc.,
440 Park Avenue South, New York 61, N.Y.

Programed text, 4200 frames, Paperback, $8\frac{1}{2}$" X 11", 600 pp., $ (?) .
Probably available in 3 separate units at $ (?) each.
Teacher's Manual Available.
Unit Tests available; not reusable.
Constructed Responses always used; no Multiple Choice; no Branching.

INTENDED POPULATION: "Remedial or reinforcing for college or high school students reviewing or having difficulty with first course in algebra. Also students who have had traditional course and wish understanding of modern approach."
Prerequisites: "Students must be taking Introductory Algebra or have taken first-year algebra."
No Additional Material required.
Time Required to Complete program: (no data available).
Student Data being used for revision.
(4 sample pages)

MATHEMATICS - ALGEBRA

INTRODUCTORY ALGEBRA PROGRAM
Drooyan, Wooton; JOHN WILEY & SONS
4 sample pages:

Drooyan & Wooton:
PROGRAMMED BEGINNING ALGEBRA (Preliminary Version)

UNIT #1

213. x^2 represents the product xx and y^3 represents the product ____.	yyy
214. The completely factored form of a^4 is aaaa and the completely factored form of b^5 is _____.	bbbbb
215. The completely factored form of a^2b^3 is aabbb and the completely factored form of x^3y^2 is _____.	xxxyy
216. The _________ ________ form of $6xy^3$ is (2)(3)xyyy.	completely factore
217. The completely factored form of $12a^3b^2c$ is ____________.	(2)(2)(3)aaabbc
218. The completely factored form of x^3yz^2 is _____.	xxxyzz

[illegible] Recall that 7 - 12 is read as the sum and -12. -8 - 3 represents the sum of and ___.	-3
[illegible] Since the difference (10) - (8) is same as the sum (10) + (-8), either these can be written as 10 - 8. Since difference (8) - (5) is the same as sum (8) + (-5), either of these can be tten as ______.	8 - 5 - - - - - - - - - - - - - - Or 3.
[illegible] The expression 3 - 5 can now be ked at in two ways, as the difference 3 and 5, or as the sum of 3 and ___.	-5
[illegible] 4 - 7 can be looked at in two ways, the difference of 4 and 7, or as the __ of 4 and -7.	sum
[illegible] 8 - 5 can be looked at as the difference of 8 and 5 or as the sum of __ and	8; -5

369. Because -7 is less than -1, the point corresponding to -7 on a line graph will be found to the _____ of the point corresponding to -1.	left
370. Because 8 > 5, the point corresponding to the number 8 on a line graph will be found to the right of the point corresponding to the number ___.	5
371. The point on a line graph corresponding to any number greater than 5 will be found to the _____ of the point corresponding to 5.	right
372. The point on a line graph corresponding to any number less than 7 will be found to the _____ of the point corresponding to 7.	left

Remark. We should now be ready to look at inequalities involving a variable. As with equations, our primary concern with these inequalities is going to be finding, and representing, solutions. Go on to Frame 373.

86. When writing the factored form of a polynomial it is customary to write any numerical factor first. Thus the form a(x + y) is generally preferred to the form (x + y)a. Of the two forms 2(x + 3) and (x + 3)2, it is preferable to write ________.	2(x + 3) - - - - - - - - - - - - - By preferable, we mean that most people write it this way.
87. Of the two forms 8(x + 3) and (x + 3)8, it is preferable to write ________.	8(x + 3)

2.

Remark: Now that you know what it means to "factor" a polynomial, your next task is to learn how to do it. As you continue through the program, if your response contains the same factors as those shown in the response column but you have them in a different order; that is, if you write (3)(2) instead of (2)(3), don't worry about it, your response is perfectly correct. Now, go on to Frame 88.

88. In order to be able to factor a polynomial, it is necessary that each term in the polynomial contain a common factor. The terms of the expression $3x^2 + 3$ contain 3 as a common _______.	factor

MATHEMATICS - ALGEBRA

MODERN MATHEMATICS: Jr.-Sr. H.S. +
A PROGRAMED TEXTBOOK Course I
LEWIS D. EIGEN, Vice President, and
JEROME D. KAPLAN,
RUTH EMERSON,
HAROLD M. KROUSE, Programers,
The Center for Programed Instruction, Inc.
Published by SCIENCE RESEARCH ASSOCIATES, Inc.,
259 East Erie St., Chicago 11, Illinois

Programed text, 8500 frames, Paperback, 800 pp., $8\frac{1}{2}$" X 11", $10.00.
Available as 10 separate units @ $1.25.
Teacher's Manual available, $1.25.
Unit and Final tests available, $2.50/set; Reusable.
Constructed Responses usually used; Multiple Choice Responses and Branching sometimes used.

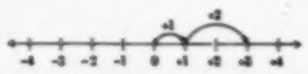
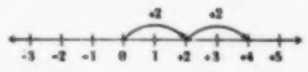
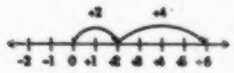
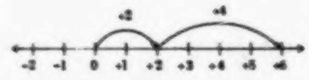
INTENDED POPULATION: "9th grade college preparatory classes; some sections for Junior High School and Elementary enrichment."
Prerequisites: "Thorough knowledge of arithmetic, 7th grade reading level."
No Additional Material Required.
Time Required to Complete Program: 82 hours (based partly on data)
Student Data being used for revision.
(9 sample pages)

MATHEMATICS - ALGEBRA

MODERN MATHEMATICS:
A PROGRAMED TEXTBOOK Course I
Eigen, Kaplan, Emerson, Krouse; SCIENCE RESEARCH ASSOCIATES
9 sample pages:

Selections from
MODERN MATHEMATICS: A PROGRAMED TEXTBOOK

Chapter 2. DIRECTED NUMBERS

+3	165.	 When we add trips (directed numbers), we always start at '0'. (+1) + (+2) = ☐.
0	166.	When we add trips (directed numbers), we always start at '☐'.
+7 *or* *(+7)* *(+7 is better.)*	167.	(+6) + (+1) = ☐. *(Hint: Draw a scale and work out the two trips if you have to.)*
+9 +11 +12	168.	(+4) + (+5) = ☐. (+2) + (+9) = ☐. (+8) + (+4) = ☐.
If your answer was three, go directly to frame 176. If your answer was not three, go to the next frame.	169.	The last frame had three problems on it. How many did you get right? ☐
+4	170.	 (+2) + (+2) = ☐.
	171.	To find out what (+2) + (+4) is, first draw a number scale. Then, starting at '0', draw an arrow representing a trip of +2. Then from '+2' draw an arrow representing a trip of +4. Draw a number scale and indicate the addition: ☐.
+6	172.	 (+2) + (+4) = ? The second arrow ends up at '☐'.
+6	173.	(+2) + (+4) = ☐.

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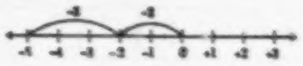
Jerome D. Kaplan, and Ruth Emerson. © 1961, Science
Research Associates, Inc.

+11	174.	(+8) + (+3) = ☐. *(Hint: To get this number you may have to draw a scale with more [illegible] than previously.)*
+12	175.	(+4) + (+8) = ☐.
Yes.	176.	If we start at '0' and take two trips to the right, do we end up to the right of '0'? ☐ *(Yes or no?)*
Yes. *(The sum of two positive numbers is a positive number.)*	177.	If we add two positive numbers, is the sum a positive number? ☐ *(Yes or no?)*
-5	178.	 -3 -2 -5 -4 -3 -2 -1 0 +1 +2 +3 (-2) + (-3) = ☐. *(Hint: Where do we end up after the two trips?)*

Chapter 5. SETS AND SUBSETS

6	1.	The numerals we use to denote numbers are: '0', '1', '2', '3', '4', '5', '☐', '7', '8', '9'.
10	2.	This set of symbols, '0', '1', '2', '3', '4', '5', '6', '7', '8', '9', is made up of ☐ *(how many?)* different symbols.
9	3.	The set of whole numbers from 0 to 9 is made up of 10 numbers. They are 0, 1, 2, 3, 4, 5, 6, 7, 8, ☐.
10	4.	The numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 form a set of ☐ *(how many?)* numbers.
set	5.	The numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 form a ☐ of 10 numbers.
c	6.	The letters *a*, *b*, ☐ form a set of the first three letters of the alphabet.
set	7.	The letters *a*, *b*, *c* form a ☐ of the first three letters of the alphabet.
y	8.	The letters *x*, ☐, *z* form a set of the last three letters of the alphabet.
set	9.	The letters *x*, *y*, *z* form a ☐ of the last three letters of the alphabet.
three	10.	The set formed by *x*, *y*, *z* is the set of the last ☐ letters of the alphabet.
y	11.	By using the symbols '{ }' to enclose *x*, *y*, *z* we can represent the set of the last three letters of the alphabet by '{*x*, ☐, *z*}'.
last	12.	By using the symbols '{ }' we can represent the set of the ☐ three letters of the alphabet by '{*x*, *y*, *z*}'.
set	13.	We can represent the ☐ of the last three letters of the alphabet by '{*x*, *y*, *z*}'.

Reprinted from MODERN MATHEMATICS by Louis D. Eigen,
Jerome D. Kaplan, and Ruth Emerson. © 1961, Science
Research Associates, Inc.

b	14.	We can represent the set of the first two letters of the alphabet by "{a, ☐}".
{ }	15.	One way to represent a set is to use the symbols "{ }". We call these symbols "set braces". They are not parentheses. Write the symbols we call set braces in the answer space. ☐
{a, b} *(Have you used the symbols "{ }" and the comma?)*	16.	When we represent the set of the first two letters of the alphabet, we use the set braces, "{ }", and we use the comma: "{a, b}". Write the symbols for this set in the answer space. ☐
{a, b}	17.	By using the set braces, "{ }", and the comma, we may represent the set of the first two letters of the alphabet by writing "☐".
y	18.	We can represent the set of the last two letters of the alphabet by "{☐, z}".
{y, z} *(Have you used the comma?)*	19.	We can represent the set of the last two letters of the alphabet by "☐".
b	20.	We can represent the set of the first three letters of the alphabet by "{a, ☐, c}".
{a, *b*, *c*, *d*} *(Have you used commas?)*	21.	We can represent the set of the first four letters of the alphabet by "☐".
three	22.	{a, b, c} is the set of the first ☐ letters of the alphabet.
set	23.	{w, x, y, z} is the ☐ of the last four letters of the alphabet.

Chapter 7. ORDERED PAIRS AND RELATIONS

pairs	86.	We call any set of ordered pairs "a relation". {(0, 1), (2, 1), (3, 2)} is a set of ordered ☐. Therefore, {(0, 1), (2, 1), (3, 2)} is a relation.
relation	87.	{(0, 2), (1, 3)} is a set of ordered pairs. Therefore, {(0, 2), (1, 3)} is a ☐.
relation *or* set of ordered pairs	88.	{(1, 3), (3, 4), (5, 1)} is a ☐.
pairs	89.	{-6, 4, -3, 1} is not a relation, since {-6, 4, -3, 1} is not a set of ordered ☐.
No.	90.	Is {5, 2, 1} a relation? ☐ *(Yes or no?)*
relation	91.	Since {(2, 0)} is a set of one ordered pair, {(2, 0)} is a ☐.
{(-1, 3), (-2, 3)} *or* {(-2, 3), (-1, 3)}	92.	Let $P = \{-1, -2\}$ and let $Q = \{3\}$. $P \times Q =$ ☐.
ordered pairs	93.	For all sets A and B, $A \times B$ is a set of ☐ ☐.
relation	94.	For all sets A and B, since $A \times B$ is a set of ordered pairs, $A \times B$ is a ☐.
pairs	95.	A relation is a set of ordered ☐.
relation	96.	A ☐ is a set of ordered pairs.
a set of ordered pairs	97.	A relation is ☐.

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Chapter 15. BINARY OPERATIONS

binary operation	64.	If the domain of an operation is a set of ordered pairs, the operation is called a binary operation. + is a ☐ ☐.
two	65.	The word binary contains the Latin prefix bi, meaning twice, which, in English, is used as a prefix meaning two. A bicycle has ☐ *(how many?)* wheels?
two	66.	Ordered pairs contain ☐ *(how many?)* elements.
ordered pairs	67.	+ is a binary operation because its domain is made up of ☐ ☐.
binary operation	68.	Because its domain is made up of ordered pairs, + is a ☐ ☐.
relation	69.	The domain of a binary operation is a set of ordered pairs. Therefore, the domain of a binary operation is a r☐.

9
4

93. Binary operations can be represented by tables. We can express a subset of the operation × as follows:

2×2 = 4; 2×3 = 6; 3×2 = 6; 3×3 = ☐.

We can then express it by this table, with the same information in different form:

×	2	3
2	☐	6
3	6	9

(Complete the table by filling in the box.)

6, 12, 16
6, 12, 16

94. 2×3 = ☐; 3×4 = ☐; 4×4 = ☐.
Complete this table for another subset of ×:

×	2	3	4
2	4	☐	8
3	6	9	☐
4	8	12	☐

25
49

95. Complete this table representing a subset of ×:

×	4	5	6	7
4	16	20	24	28
5	20	☐	30	35
6	24	30	36	42
7	28	35	42	☐

Chapter 19. COMMUTATIVE OPERATIONS

sleeves	1.	The result of rolling up your sleeves, either right then left or left then right, is that both ☐ are rolled up. Either order gives the same result.
socks	2.	Putting on socks before shoes ends with the shoes outside. Putting on shoes before socks ends with the ☐ outside.

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No.	3.	We have two orders for putting on socks and shoes: first socks, then shoes, and first shoes, then socks. Do these two different orders produce the same result? ☐ *(Yes or no?)*
Yes.	4.	Suppose that you have two mathematics textbooks to study: *Introductory Calculus* and *Advanced Calculus*. Does the order in which you study these books make any difference? ☐ *(Yes or no?)*
No.	5.	Suppose that you have two fiction books to read: *Treasure Island* and *Buck Rodgers Explores the Canals of Mars*. Does the order in which you read these make any difference? ☐ *(Yes or no?)*
2	6.	If we multiply 2 by 3, the **product** is equal to the product we get when we multiply 3 by ☐.
3	7.	If we add 3 to 2, the **sum** is the same as when we add 2 to ☐.

commutative	33.	Consider any operation $*$. If $*(a, b) = *(b, a)$ for any a, b in a set S, we say that the set S is **commutative** with respect to $*$. Let R = {the real numbers}, $p \in$ R, and $q \in$ R. Since $*(p, q) = *(q, p)$, we say that R is [com] with respect to the operation ☐.
p commutative	34.	A set S is commutative with respect to an operation $*$ if $*(a, b) = *(b, a)$ whenever $a \in S$ and $b \in S$. If we have specified the set S, we will use the abbreviation '$*$ is a **commutative operation**'. Let us specify that we are considering R. If $p \in$ R and $q \in$ R, $*(p, q) = *(q,$ ☐$)$. Therefore, we say that $*$ is a ☐ operation.
3 commutative operation	35.	When we say that any operation $*$ is a commutative operation, we mean that the **order** of two elements with respect to $*$ can be reversed without altering the **result** of the operation. The expressions '3 + 1' and '1 + ☐' give the same result, 4, because + is a ☐ ☐.
mutate	36.	The word '**mutation**' means a change: if a thing **mutates**, it changes; if you change something, you [m e] it.
commutative	37.	The word 'commutative' is built on the word '**mutate**'. When the **order** of two elements in an operation $*$ can be **changed** without altering the result, we call $*$ a [com ive] operation.
image	38.	$*(a, b) = c$; $*(b, a) = c$. $*$ is a commutative operation, since both (a, b) and (b, a) have the same ☐ under $*$, where a and b are any real numbers.

Chapter 26. EQUATIONS, PRONUMERALS, AND SOLUTION SETS

True.	20.	Equations and inequations are symbols for statements. '$5 = 3 + 2$' is a symbol for a statement. Is the statement true or false? ☐
false	21.	Some statements are true and some statements are false. If an equation stands for a true statement, we will say that the equation is a **true equation**. If an equation stands for a **false** statement, we will say that the equation is a ☐ equation.
false	22.	'$5 = 3 + 1$' is an equation. '$5 = 3 + 1$' is a ☐ *(true or false?)* equation.

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Chapter 26. EQUATIONS, PRONUMERALS, AND SOLUTION SETS

2	55.	$5 + \Delta = 7$. Since only a numeral for 2 can replace 'Δ' to make a true equation, the solution set of this equation is {☐}.
1	56.	$3 + y = 4$. Since only a numeral for 1 can replace 'y' to make a true equation, the solution set of this equation is {☐}.
{3} *(Don't forget the set braces.)*	57.	$4 + \Delta = 7$. Since only a numeral for 3 can replace 'Δ' to make a true equation, the solution set of this equation is ☐.
2	58.	$5 + \Delta = 7$. To make a true equation, we must replace 'Δ' with a numeral for ☐.
set	59.	$5 + x = 9$. The solution ☐ of this equation is {4}.
{1}	60.	☆ + 1 = 2. The solution set of this equation is ☐.
solution set	61.	$9 + a = 16$. {7} is the ☐ ☐ of this equation.
{2}	62.	$5 + ? = 7$. The solution set of this equation is ☐.
solution set	63.	$t + 5 = 11$. The ☐ of this equation is {6}.
{11}	64.	$5 + 6 = \Delta$. The solution set of this equation is ☐.

Chapter 28. IDENTITIES, EXPRESSIONS, AND TERMS

Yes.	123.	If two equations have the same solution set, then we say that the two equations are **equivalent equations**. Are '$x + 2 = 5$' and '$x = 3$' equivalent equations? ☐ *(Yes or no?)*
equivalent solution set	124.	'$y - 3 = 5$' and '$y - 2 = 6$' are ☐ equations because they have the same ☐ ☐.
equivalent they have the same solution set	125.	'$\beta = -6$' and '$\beta - 2 = -8$' are ☐ equations because ☐.
No. *(The solution sets are {4} and {8}.)*	126.	Are '$y + 2 = 6$' and '$y - 3 = 5$' equivalent equations? ☐ *(Yes or no?)*
y = 3	127.	Since '$y = 3$' and '$y + 2 = 5$' are equivalent equations, we can say that '$y = 3$' is equivalent to '$y + 2 = 5$' and that '$y + 2 = 5$' is equivalent to '☐'.
basic	128.	If one expression of an equation has only one term, a **pronumeral** completely alone, and the other expression contains no **pronumeral** at all, then we say that the equation is a **basic equation**. '$x = 3$' is a b☐ equation.

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basic equation	129.	'$x = y$' is not a ☐ ☐.
Yes.	130.	Is '$2 = y$' a basic equation? ☐ *(Yes or no?)*
pronumeral	131.	'$x = 2x-3$' is not a basic equation. There is a p☐ in both expressions.
No.	132.	Is '$x = 2x-6$' a basic equation? ☐ *(Yes or no?)*
No.	133.	'$t+1 = 2$' is not a basic equation, since the left expression contains two terms, not just the pronumeral. Is '$m-3 = 17$' a basic equation? ☐ *(Yes or no?)*
a, c, and d	134.	Which of the following are basic equations? ☐ a) $x = 4$. b) $x-2 = 6$. c) $y = 2$. d) $2 = y$. e) $t = 2t-4$.
Yes.	135.	'$b = 2+1$' and '$3(2)+4 = b$' are both basic equations. Is '$t = 4(-3)+1$' a basic equation ? ☐ *(Yes or no?)*
No.	136.	'$2q = 6$' is not a basic equation, since the left expression does not contain 'q' alone. Is '$5t = 25$' a basic equation? ☐ *(Yes or no?)*
alone	137.	'$-x = 6$' is not a basic equation either, since the pronumeral 'x' is not completely ☐ in the left expression.
a, b, and f	138.	Which of the following are basic equations? ☐ a) $a = -6$. b) $2+1 = q$. c) $-12 = -h$. d) $6\Delta+1 = 7$. e) $5b = 12$. f) $b = 4(6)+12$.
7	139.	The solution sets of basic equations are very easy to find. What is the solution set of '$t = 2(3)+1$'? {☐}

Chapter 30. ONE-STEP EQUATIONS

7	23.	$3+4 = k-4+4$. The expression '$3+4$' can be simplified to only one term. '$3+4$' is equivalent to '☐'.
k	24.	$3+4 = k-4+4$. The expression '$k-4+4$' can also be simplified to only one term. '$k-4+4$' is equivalent to '☐'.
k	25.	If '$3+4$' is equivalent to '7' and '$k-4+4$' is equivalent to 'k', then '$3+4 = k-4+4$' must be equivalent to '$7 =$ ☐'.
7 equivalent	26.	'$3 = k-4$' is equivalent to '$3+4 = k-4+4$'. '$7 = k$' is also equivalent to '$3+4 = k-4+4$'. Therefore, '$3 = k-4$' and '☐ $= k$' must be ☐ to each other.

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{7}	27.	The solution set of '7 = x' is ▭.
solution sets {7}	28.	Since '7 = x' and '3 = x − 4' are equivalent, their [s▭] must be equal. Therefore, the solution set of '3 = x − 4' is ▭.
adding expressions	29.	3 = x − 4. 7 = x. We have taken a non-basic equation and transformed it into an equivalent basic equation whose solution set was easy to find. We transformed the equation by ▭ the same number to the values of both of its ▭.
7	30.	Solve 'x − 7 = 3'. Adding 7 to the values of both expressions gives us 'x − 7 + ▭ = 3 + 7'.
equivalent x	31.	'x − 7 + 7 = 3 + 7' can be simplified to the [e▭] equation '▭ = 10'.
{10}	32.	The solution set of 'x = 10' is ▭.
{10}	33.	We start with 'x − 7 = 3'. By adding 7 to the value of both expressions we transform 'x − 7 = 3' into 'x = 10', which is a basic equation equivalent to 'x − 7 = 3'. The solution set of 'x = 10' is {10}. Therefore, the solution set of 'x − 7 = 3' is ▭.
basic equation	34.	We can easily solve a non-basic equation if we can transform it into an equivalent basic equation. The solution set of the non-basic equation will be the same as the solution set of the ▭ ▭.
equivalent	35.	The first step in solving a non-basic equation is to transform it into a basic equation that is ▭ to the non-basic equation.
basic	36.	If we add the same number to the values of both expressions of an equation, we transform the equation into an equivalent equation. However, to solve our equation we want to transform it into an equivalent [b▭] equation.
expressions pronumeral	37.	To obtain a basic equation, we must isolate the pronumeral in one expression. In other words, we must know which number to add to the values of both ▭. The addition of this number must isolate the ▭ in one expression.

Chapter 25. WORD PROBLEMS

f 200 3 •	79.	One-third of a forest was destroyed in a fire, and then 200 more trees were cut down, leaving 1200 trees. How many trees were there before the fire? Let f be the original number of trees. Then $1200 = \frac{\boxed{}}{3} - \boxed{}$. This equation is equivalent to $f = \boxed{}1200\boxed{}200$.
original posts ½ 24	80.	A dance floor was held up by supporting posts. When people started doing rock and roll, half as many more posts were needed as there were originally. When the new posts were added, there were 24 all together. How many posts were there originally? If p is the [o▭] number of ▭, then p + ▭p = ▭.

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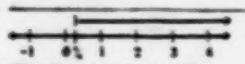
windows closed 2	60.	A house has 30 windows. Half of them face north, and a third of the remaining ones face west. If it rained in from the west, how many windows should be closed? If n is the number of [w] to be [c], then $n = \frac{30}{\square} \cdot \frac{1}{3}$.
one No. *(The solution set of "32+80+n = 130" is {18}. This means there will still be 22 seconds of green light in which to cross the street, since 32 − 10 = 22.)*	61.	Suppose it takes you 130 seconds to walk a block. The green light lasts 32 seconds, and the red light lasts 80 seconds. If the green light at the next corner is just starting as you begin the block, will you have to wait for the light when you reach the corner? The equation for this problem is "32+80+n = 130", where n is the difference between the number of seconds it takes to walk the block and the number of seconds for one green and [ ] (how many?) red light(s). Will you have to wait for the light? [ ] *(Yes or no?)*

Chapter 27. SOLVING INEQUALITIES

−3	62.	To find a basic inequality that is equivalent to '$x+3 < 7$', we must add [ ] (what number?) to the value of each expression.
$x < 4$ *or* $x < 7-3$	63.	If we add −3 to the value of each expression of '$x+3 < 7$', we get the equivalent basic inequality '[ ]'.
solution set	64.	'$x < 4$' is equivalent to '$x+3 < 7$'. Both of these inequalities have the same [s] [s].
$\{x: x < 4\}$	65.	What is the solution set of '$x < 4$'? [ ]
$\{x: x < 4\}$	66.	What is the solution set of '$x+3 < 7$'? [ ]
$x > 7\frac{2}{3}$ *(Add 7 to the value of each expression.)*	67.	Write a basic inequality that is equivalent to '$x-7 > \frac{2}{3}$'. [ ]
$\{x: x > 7\frac{2}{3}\}$	68.	'$x > 7\frac{2}{3}$' is equivalent to '$x-7 > \frac{2}{3}$'. What is the solution set of '$x-7 > \frac{2}{3}$'? [ ]
$\{a: a > 1\}$	69.	What is the solution set of '$\Delta+10 > 11$'? [ ]
$\{r: r > 2\frac{1}{3}\}$	70.	What is the solution set of '$r+6\frac{2}{3} > 9$'? [ ]
 *(The solution set is $\{p: p > \frac{1}{2}\}$.)*	71.	Graph the solution set of '$p+\frac{1}{2} > 1$'. [ ]

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MATHEMATICS - ALGEBRA

INTERMEDIATE MATHEMATICS SERIES: H.S.
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PAUL THOMAS,
CHARLOTTE YESSELMAN, Programers, TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 2500 frames, Vinyl cover, 500 pp., 8½" X 11", $ (?) .
For use in Min/Max, Min/Max II machines; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
"No tests available other than those enclosed with course"; not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "Brush-up for students entering college. Has also been used successfully as an Algebra review by students preparing for a first course in Calculus."
Prerequisites:
No Additional Material required.
Time Required to Complete program: 30 to 40 hours (based solely on data).
Student Data being used for revision.
(2 sample pages)

MATHEMATICS - ALGEBRA

**INTERMEDIATE MATHEMATICS SERIES:
ALGEBRA REFRESHER**
Law, Thomas, Yesselman; TMI-GROLIER
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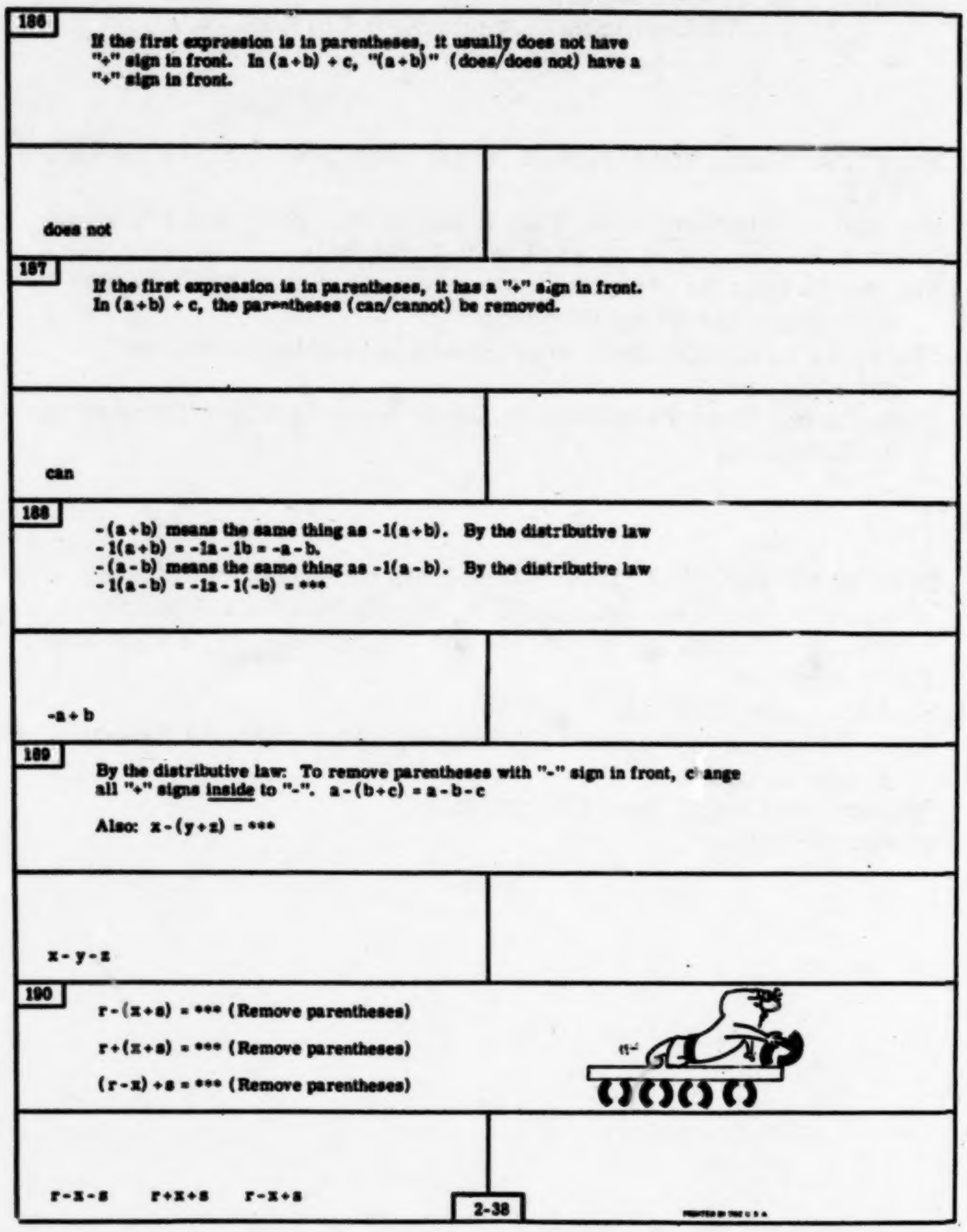


186

If the first expression is in parentheses, it usually does not have "+" sign in front. In $(a+b)+c$, "$(a+b)$" (does/does not) have a "+" sign in front.

does not

187

If the first expression is in parentheses, it has a "+" sign in front. In $(a+b)+c$, the parentheses (can/cannot) be removed.

can

188

$-(a+b)$ means the same thing as $-1(a+b)$. By the distributive law
$-1(a+b) = -1a - 1b = -a - b$.
$-(a-b)$ means the same thing as $-1(a-b)$. By the distributive law
$-1(a-b) = -1a - 1(-b) =$ ***

$-a+b$

189

By the distributive law: To remove parentheses with "-" sign in front, change all "+" signs inside to "-". $a-(b+c) = a-b-c$

Also: $x-(y+z) =$ ***

$x-y-z$

190

$r-(x+s) =$ *** (Remove parentheses)

$r+(x+s) =$ *** (Remove parentheses)

$(r-x)+s =$ *** (Remove parentheses)

$r-x-s$ $r+x+s$ $r-x+s$

2-38

6

$x = y + 2$
If $y = -3$, $x = -1$
If $y = -1$, $x =$ ····
If $y = 0$, $x =$ ····
If $y = 1$, $x =$ ····

1
2
3

7

Make a table for the equation: $x = 2y$.

If $y = -1$, $x = -2$

Fill in the table. °°°

x	y
-2	-1
0	0
2	1
4	2

x	y
-2	-1
	0
	1
	2

8

$y = \frac{x}{2} - 4$

If $x = -2$, $y = \frac{-2}{2} - 4 = -1 - 4 = -5$

Fill in the table. °°°

x	y
-2	-5
0	-4
2	-3
4	-2

x	y
-2	
0	
2	
4	

9

$x = \frac{3y}{2} - 2$

If $y = -1$, $x = \frac{3(-1)}{2} - 2 = \frac{-3}{2} - \frac{2}{1} = \frac{-3}{2} - \frac{4}{2} = \frac{-7}{2} = -3\frac{1}{2}$

Fill in the table. °°°

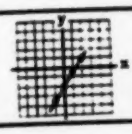
x	y
$-3\frac{1}{2}$	-1
-2	0
$-\frac{1}{2}$	1
1	2

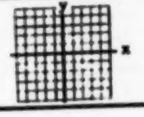
x	y
$-3\frac{1}{2}$	-1
	0
	1
	2

10

Plot and connect in order. °°°

x	y
-1	$-3\frac{1}{2}$
0	-2
1	$-\frac{1}{2}$
2	1





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MATHEMATICS - ALGEBRA

THE LANGUAGE OF ALGEBRA (FIELDS AND ORDERED FIELDS) College
F. WILLIAM LAWVERE, Britannica Center for Studies in Learning and Motivation.
Published by ENCYCLOPAEDIA BRITANNICA FILMS, Inc.,
1150 Wilmette Ave., Wilmette, Ill.

Programed text, 1947 frames, Paperback, 342 pp., 8½" X 11", $7.30.
For use in KONCEPT-O-GRAPH machine; program reusable.
Answer books available.
Teacher's Manual available; included with program.
Diagnostic tests available @ $1.50 per package of 30; not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: Introductory College students.
Prerequisites: "Algebra I and II".
Additional Equipment required: "Student Supplement - essential to the course and included in price above."
Time Required to Complete the program: one semester (based partly on data).
Student Data being used for revision.
(2 sample pages)

MATHEMATICS - ALGEBRA

THE LANGUAGE OF ALGEBRA (FIELDS AND ORDERED FIELDS)

Lawvere; ENCYCLOPAEDIA BRITANNICA FILMS
2 sample pages:

EXPRESSIONS

57. The factors of the expression $((ab)+c)x$ are the two expressions ____________ , ______ .	$(ab)+c$, x
58. The expression $(ab)+((a+b)(x+y))$ is the sum of the two expressions, ________ and ____________ .	ab, $(a+b)(x+y)$
59. Another very important convention for omitting parentheses is the following: if one of the terms of a sum is itself a product, we neglect to put the parentheses around it in forming that sum. For example the expression $(ab)+((a+b)(x+y))$ will always be abbreviated to read $ab+(a+b)(x+y)$. The sum of the two expressions xy and $a(x+y)$ which, by the strict definition of sum, should be written as $(xy)+(a(x+y))$ will be abbreviated to read ____________ .	$xy+a(x+y)$
60. The convention is that a term which is itself a ____________ will not be enclosed in parentheses.	product
61. The sum of the two expressions $u+v$, ax will be written $(u+v)+ax$. The sum of the two expressions $ab+c$, $(a+b)x$ will be written ______________________ .	$(ab+c)+(a+b)x$
62. The expression $6\cdot 7+3$ abbreviates the expression $(6\cdot 7)+3$ which represents the number ________ .	45
63. According to our convention for omitting parentheses, the ________ of the two expressions ay, $x+4$ is the expression $ay+(x+4)$.	sum

EXPRESSIONS

64. The sum of the two expressions $(x+a)(y+b),\ xy$ is written in our abbreviated form as ______ ______.	$(x+a)(y+b)+xy$
65. When interpreting expressions which have been abbreviated by omitting parentheses, a brief rule to remember is: Multiply first, then add. For example, the expression $2\cdot 8+1$ is actually an abbreviation of the expression $(2\cdot 8)+1.$ Therefore, to evaluate the expression $2\cdot 8+1$, we first ______ 2 by 8 and then ______ 1 to the product.	multiply, add
66. The expression $7\cdot 3+5\cdot 4$ is actually an abbreviation for the expression $(7\cdot 3)+(5\cdot 4);$ hence, it represents the number ______.	41
67. The expression $3\cdot 11+4\cdot 7$ is the sum of the two expressions, $3\cdot 11$ and $4\cdot 7$. Thus it represents the number ______	61
68. The expression $(5\cdot 4+2)+3\cdot 8$ is the sum of the two expressions $5\cdot 4+2$, ______. It thus represents the number ______.	$3\cdot 8$, 46
69. The expression $5\cdot 3+2$ represents the number ______.	17
70. The expression $2\cdot 6+(5\cdot 3+2)$ represents the number ______	29
71. The expression $3(2\cdot 6+(5\cdot 3+2))$ represents the number ______.	87

MATHEMATICS - ALGEBRA

ALGEBRA I H.S. +
DANIEL P. MURPHY, Teaching Fellow at the
State University of Iowa
Published by ENCYCLOPAEDIA BRITANNICA FILMS, Inc.
1150 Wilmette Ave., Wilmette, Ill.

Programed text, 8312 frames, Paperback, 8½" X 11", 1,145 pp., $13.25.
For use in KONCEPT-O-GRAPH machine; program reusable.
Teacher's Manual available; free with classroom order.
Diagnostic tests available @ $1.50 per package of 30; not reusable.
Constructed and Multiple Choice Responses usually used; no Branching.

INTENDED POPULATION: 9th grade.
Prerequisites: "General mathematics background."
Additional Equipment required: Student Supplement, included in above price.
Time Required to Complete program: 135 classroom hours (based partly on data).
Student Data being used for revision.
(8 sample pages)

MATHEMATICS - ALGEBRA

ALGEBRA I
Murphy; ENCYCLOPAEDIA BRITANNICA FILMS
8 sample pages:

247. Is this an expression? _______ 12	No (since there is only one number and no symbol of arithmetical operation indicated).
248. Which of these is an expression? ________________ $15, 25, 3x, x$	$3x$ (the two numbers, 3 and x, are joined by multiplication.)
249. Since these two literal numbers are joined together by the symbol for addition, this is an _____________. $x+y$	expression
250. Expressions are made up of terms. A term is a number separated from other numbers by a plus or minus sign. Products, quotients, or single numbers can be terms. The expression, $3+4$, is composed of how many terms? _____ (The terms here are called 3 and $+4$, because the sign between the terms belongs to the term following that sign.)	two
251. This expression contains ______ terms. $a+b-c+3$	four
252. This expression contains two terms, _____ and $+3$. Notice that the sign between the terms is written with the term following the sign. $2y+3$	$2y$
253. This expression contains two terms, 5 and _____. (Remember to include the symbol for arithmetic operation in your answer.) $5+2y$	$+2y$
254. This expression contains three ______, $3x$, $+2z$, and $-3y$. $3x+2z-3y$	terms
255. This expression contains two terms, _____ and $+4$. $\frac{x}{y}+4$	$\frac{x}{y}$

256. This expression contains two terms, $3x$ and ________ . $3x+\frac{a}{b}$	$+\frac{a}{b}$
257. This expression contains ________ terms. $5a+3b-4c+3$	four
258. This expression contains four terms, $9x$, $+4y$, ________ , and $+5$. (Remember to include symbol of arithmetic operation with the term.) $9x+4y-\frac{1}{4s}+5$	$-\frac{1}{4s}$
259. The second term of this expression is $+3b$. What is the fourth term? ________ $5a+3b-4c-3$	-3
260. This is an ____________ which contains four terms. $ab+c+3x+6$	expression
261. Write the expression for "the sum of r and s." ________	$r+s$
262. Write the expression "x added to y." ____________	$x+y$
263. Write the expression for "m increased by 12." _______	$m+12$
264. Subtraction examples are worded in several ways. When the word "less" is used, it means to subtract the second number from the first number. Write the expression for, not the answer to, "eight less 5." _______ "Six less x" is written $6-x$	$8-5$
265. How would you write "twelve less seven?" _______	$12-7$

266. Write the expression, not the answer, for "fifteen less eight." ______

$15-8$

267. Write the expression for "seven less y." ______

$7-y$

268. Write the expression for "fifteen less z." ______

$15-z$

269. Write the expression for "a less 12." ______

$a-12$

270. Write the expression for "x less 15." ______

$x-15$

271. Write the expression for "x less y." ______

$x-y$

272. Write the expression for "a less b." ______

$a-b$

273. The expression "five subtracted from nine" is written: $9-5$. This wording tells us to subtract the first number from the second number. Notice that the number following the word "from" is the minuend, and is written first. Write the example expressing "twelve subtracted from twenty-five." ______

$25-12$

274. Write the expression for "twenty-seven subtracted from thirty-eight." ______

$38-27$

275. Write the expression for "three subtracted from eleven." ______

$11-3$

276. Write the expression for "fourteen subtracted from twenty-one." ______

$21-14$

277. Write the expression for "k subtracted from twelve." ______

$12-k$

278. Write the expression for "s subtracted from fifteen." ______	$15-s$
279. Write the expression for "z subtracted from fifteen." ______	$15-z$
280. Write the expression for "twelve subtracted from k." ______	-12
281. Write the expression for "three subtracted from a." ______	$a-3$
282. Write the expression for "seven subtracted from s." ______	$s-7$
283. Write the expression for "t subtracted from k." ______	$k-t$
284. Write the expression for "z subtracted from y." ______	$y-z$
285. Write the expression for "b subtracted from a." ______	$a-b$
286. Six less than nineteen" is written $19-6$. Notice that when the phrase "less than" is used, the number following the minus sign is the *minuend*. You are to subtract the first number *from* the second number. How do you write "five less than nine?" ______	$9-5$
287. Write the expression for "seven less than fifteen." ______	$15-7$
288. Write the expression for "eight less than twenty-five." ______	$25-8$
289. Write the expression for "x less than fifteen." ______	$15-x$
290. Write the expression for "x less than twelve." ______	$12-x$

291. Write the expression for "fifteen less than x." ______	$x-15$
292. Write the expression for "five less than z." ______	$z-5$
293. Write the expression for "twelve less than b." ______	$b-12$
294. Write the expression for "b less than a." ______	$a-b$
295. Write the expression for "t less than x." ______	$x-t$
296. Write the expression for "s less than r." ______	$r-s$
297. Write the expression for "k less than g." ______	$g-k$
298. Write the expression for "eight subtracted from k." ______	$k-8$
299. The expression for "five less x" is written $5-x$. In this terminology, the phrase "less than" is absent. Hence, the first number is the minuend, and the second number is the ______.	subtrahend
300. The expression for "six less k" should be written ______.	$6-k$
301. The expression for "twelve less *than* x" is written $x-12$. The expression for "twelve less x" is written $12-x$. Notice that when the words "from" or "less than" are used, the number *following* these words is the minuend. However, when neither of these words is used, the first number is the minuend. Write the expression for "twenty-seven less than x." ______	$x-27$
302. Write the expression for "y subtracted from nine." ______	$9-y$
303. Write the expression for "c minus p." ______	$c-p$

304. Write the expression for "k decreased by seven." To decrease one number by a given quantity, we subtract the second number from the first. ______ $k-7$

305. Write the expression for "fifteen decreased by seven." ______ $15-7$

306. Write the expression for "twelve decreased by three." ______ $12-3$

307. Write the expression for "fifteen decreased by x." ______ $15-x$

308. Write the expression for "twelve decreased by b." ______ $12-b$

309. Write the expression for "z decreased by fifteen." ______ $z-15$

310. Write the expression for "k decreased by eleven." ______ $k-11$

311. Write the expression for "x decreased by y." ______ $x-y$

312. Write the expression for "t decreased by r." ______ $t-r$

313. This is an expression which is made up of two ______ . terms
$c-d$

314. Recall that we use parentheses to indicate multiplication of two or more numbers. Hence, the product of five and seven is written 5(7). According to the Commutative Principle, this may also be written 7(5). Since the number of possible combinations grows rapidly with an increasing number of multipliers, we will usually have only one arrangement in the answer. If your answer is correct, except for the order of the numbers, do not mark it wrong. Write the expression for "the product of eleven and six." ______ 11(6)

315. Write the expression for "the product of twelve and six." ______

12(6)

316. Write the expression for "the product of five and nine." ______

5(9)

317. Write the expression for "the product of eleven and six." Notice that the order of the numbers is unimportant in the answer. When we have a series of numbers to be multiplied, they may be written in any order at all, and still be correct. If the only difference between your answer and the answer given in the program is the order of the numbers presented, do not consider your answer wrong. ______

11(6)

318. Recall that when we multiply two or more arithmetic numbers, we must use parentheses around all of the numbers except the first one. Write the expression for "six times nine times seven." ______

6(9)(7)

319. Write the expression for "three times two times four." ______

3(2)(4)

320. You will remember that when we multiply an arithmetic number by a literal number, we do not use parentheses. To standardize the way in which we write expressions similar to the example below, we *always* write the arithmetic number *first*, then the literal number. However, according to the Commutative Principle for Multiplication, we may write the literal number first, without changing the value of the product. Thus, the value of $15x$ is the same as the value of $x15$. As noted before, we ask you to write the arithmetic number first, only in order to have a standard practice for all students to follow. Write the expression for "the product of seven and k." ______

$7k$

321. Write the expression for "the product of five and x." ______

$5x$

322. Write the expression for "the product of r and s." ______

rs

323. Write the expression for "the product of seven and six." ______

7(6)

324. Write the expression for "the product of seven and a." ______	$7a$
325. "Four times three times y" would be written $4(3y)$. How would you write "six times nine times a?" ______	$6(9a)$
326. Write the expression for "eight times seven times x." ______	$8(7x)$
327. "Nine times y times seven" would be written $9(7y)$, or $7(9y)$. This follows from the Commutative Principle for Multiplication. Remember, it will be our practice to write the arithmetic numbers first, and the literal numbers last. Also recall tha[illegible] is not necessary to use parentheses to separate an arithmetic number and a literal number. How would you write the expression for "five times a times 6?" ____________	$5(6a)$ or $6(5a)$
328. Write the expression for "three times k times nine." ____________	$3(9k)$ or $9(3k)$
329. Write the expression for "x times three times five." (Remember, we always write the arithmetic numbers first.) ____________	$3(5x)$ or $5(3x)$
330. "Six times nine times a times b" would be written $6(9ab)$ or $9(6ab)$. How would you write the expression for "two times four times x times y?" ____________	$2(4xy)$ or $4(2xy)$
331. Write the expression for "nine times six times r times a." ____________ (Follow the practice of writing the letters in alphabetic order, although they may be written in any order without changing the value of the product, according to the Commutative Principle for Multiplication.)	$9(6ar)$ or $6(9ar)$
332. Write the expression for "two times three times a times b." ____________	$2(3ab)$ or $3(2ab)$

MATHEMATICS - ALGEBRA

IMPORTANT IDEAS IN ALGEBRA Elementary +
Edited by ALEXANDER SCHURE,
President, New York Institute of Technology
Published by EDUCATIONAL AIDS PUBLISHING Corp.,
Carle Place P.O., L.I., N.Y.

1000 frames; program for use in EDUMATOR machine.
Teacher's Manual not available.
Unit, Final, Diagnostic tests not available.
Constructed Responses usually used; some Multiple Choice and Branching.

INTENDED POPULATION: "6th grade and upwards."
Prerequisites:
Additional Equipment required: "Programs are designed to fit into EDUMATOR."
Time Required to Complete program: "student pace"
Student Data being used for revision.
(one sample page)

MATHEMATICS - ALGEBRA

IMPORTANT IDEAS IN ALGEBRA
Schure; EDUCATIONAL AIDS
one sample page:

veniently state basic rules by means of formulas. The next frames make clear how f_______ save time and space.

STOP

formulas

861. When using formulas, it is necessary that the correct meanings be attached to the letters and other s_______ls used in them.

STOP

sYMBOls

862. Let's start with a familiar one. The rule is: "The perimeter P of a triangle is the sum of its sides a, b, and c. The formula is P=_______.

STOP

a+b+c

863. The rule: The perimeter P of a regular hexagon (six-sided figure) is six times the length of a side s. The formula is ?=?

STOP

P=6s

864. The rule: The area A of a triangle is half the product of its base b and its height h. The formula is A = ______.

STOP

½bh

865. The rule: The circumference C of a circle is 3.14 times the diameter d. The formula is C = _________.

STOP

3.14d

866. The volume V of a rectangular solid is the product of its length L, width W, and height H. The formula is ________.

STOP

V=LWH

867. P=a+b+c is a formula. But it is also a literal _________.

STOP

equation

868. Formulas such as I=prt, A=lw, P=a+b+c, are called _______ equations.

MATHEMATICS - ALGEBRA

ALGEBRA II H.S.
Second Year High School Algebra
ROBERT J. TITIEV, Britannica Center for
Studies in Learning and Motivation
Published by ENCYCLOPAEDIA BRITANNICA FILMS, Inc.,
1150 Wilmette Ave., Wilmette, Ill.

Programed text, 7373 frames, Paperback, 1,036 pp., $8\frac{1}{2}$" X 11", $13.25.
For use in KONCEPT-O-GRAPH machine; program reusable.
Answer sheets available.
Teacher's Manual available, free with classroom order.
Diagnostic tests available @ $1.50 per package of 30; not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: Second year high school students.
Prerequisites: "Algebra 1."
Additional Equipment required: Student Supplement (included in price above.
Time Required to Complete program: 120 classroom hours (based partly on data).
Student Data being used for revision.
(7 sample pages)

MATHEMATICS - ALGEBRA

ALGEBRA II
Titiev; ENCYCLOPAEDIA BRITANNICA FILMS
7 sample pages:

300. $-10-5=$ ________ (Notice that -10 and -5 have the same sign)	-15
301. $-17+3=$ ________	-14
302. $6+(-18)=6-18=$ ________	-12
303. $-8+17=$ ________	9
304. $5+(+3)=$ ________	8
305. Add $\begin{array}{r} -13 \\ \underline{2} \end{array}$	-11
306. Add $\begin{array}{r} -7 \\ \underline{-6} \end{array}$	-13
307. Add $\begin{array}{r} 12 \\ \underline{-8} \end{array}$	4
308. $-12+(-8)=$ ________	-20
309. $-12+8=$ ________	-4
310. To add a series of numbers having different signs, first add all the positive numbers together. Then, add all the negative numbers. After this, add the sum of the positive numbers and the sum of the negative numbers. To find $9-3+2-5$, begin by adding the ________ numbers, 9 and 2. Next, add the ________ numbers, -3 and -5. Then, add the sums of the positive and negative numbers.	positive negative
311. What is the value of $9-3+2-5$? ________	3

312. Example: $17+3-5+2-8-3$ The sum of all the positive numbers in the example is ________ The sum of all the negative numbers in the example is ________ What number do you get by adding the sums of the positive and the negative numbers in this example? ________	22, -16, 6
313. What integer is equal to $11-9+3+10-5$? ________	10
314. Add $\begin{array}{r}2\\-6\\9\\\underline{-8}\end{array}$	-3
315. Notice that $\frac{19}{21}$ is greater than $\frac{8}{21}$. What is the sum of $-\frac{19}{21}$ and $\frac{8}{21}$? ________	$-\frac{11}{21}$
316. $\frac{17}{53}+\frac{2}{53}-\frac{11}{53}-\frac{9}{53}=$ ____________	$-\frac{1}{53}$
317. $\frac{5}{101}-\frac{7}{101}-\frac{10}{101}=$ ____________	$-\frac{12}{101}$
318. As in arithmetic, it is first necessary to find common denominators before fractions with unlike denominators can be added. What is the sum of $-\frac{9}{10}$ and $\frac{3}{5}$? ____________	$-\frac{9}{10}+\frac{6}{10}=-\frac{3}{10}$
319. $-\frac{11}{15}+\frac{1}{5}=$ ____________	$-\frac{11}{15}+\frac{3}{15}=-\frac{8}{15}$
319a. If two real numbers have the same sign, then their product will be positive. The product of two positive numbers will therefore be ________	positive

320. The product of two negative numbers will also be ________.	positive
320a. If two real numbers have opposite signs, then their product is negative. The product of a positive number and a negative number will thus be ________	negative
321. The procedure for multiplying any two real numbers is this: first multiply their absolute values, then prefix the sign (+) if both the real numbers have the same sign. Prefix the sign (−) if the two numbers have opposite signs. Will the product of −2 and −3 be positive or negative? ________	positive
321a. In order to find the product of −7 and 3, we must first multiply the ________ values of −7 and 3.	absolute
322. −7 and 3 have opposite signs. Therefore, to find the product of −7 and 3, we must put a ________ sign before the product of their absolute values.	minus
322a. What is the product of −7 and 3? ________	−21
323. Notice that −10 and −3 both have the same sign. What is the product of −10 and −3? ________	30
323a. Find the product of $\frac{3}{5}$ and $-\frac{2}{7}$. ________	$-\frac{6}{35}$
324. If two real numbers have the same sign, then their product will be a ________ number.	positive
324a. $(+5)(+7) =$ ________	35
325. $(-3)(-10) =$ ________	30

325a. If two real numbers have opposite signs, then their product will be a ________ number.	negative
326. $(-13)(+2) =$ ________	-26
326a. $(5)(-8) =$ ________	-40
327. $\frac{2}{3}\left(-\frac{2}{5}\right) =$ ________	$-\frac{4}{15}$
327a. $(-7)(8) =$ ________	-56
328. $(-3)(-9) =$ ________	27
328a. $5(-11) =$ ________	-55
329. To find the product of three or more factors, multiply them two at a time. For example, to find the value of $2(-3)(-7)$, we could first multiply together 2 and -3. Then we could multiply the product of 2 and -3 by the number ________	-7
330. The product of 2 and -3 is ________ What is -7 times the product of 2 and -3? ________	-6, $(-7)(-6) = 42$
331. What integer is equal to $-5(-3)(-2)$? ________	-30
332. $3(-4)(-2) =$ ________	24
333. $-5(-3)(-2) =$ ________	-30
334. $2(-2)(3) =$ ________	-12

335. The procedure for subtracting any two real numbers is to change the sign of the number to be subtracted, and then continue as in addition. In subtracting -6 from 12, the first step is to change the ________ of the number to be subtracted, which is -6.	sign
336. After changing -6 to 6, we then proceed to ________ the number 6 to 12.	add
337. The sum of 6 and 12 is 18. We have thus found that $12-(-6)$ is equal to ________	18
338. To subtract 7 from -11, we must first change the sign of 7 from plus to ________	minus $(-)$
339. We then add the number -7 to the number -11 and get ________ for an answer.	-18
340. Subtract -7 from 12. ________ (Change the sign of -7 and then add)	$12+7=19$
341. Subtract $\frac{-2}{23}$ from $\frac{5}{23}$. ________	$\frac{7}{23}$
342. To subtract one number from another, change the sign of the number to be ________ and then proceed as in ________	subtracted, addition
343. Example: $\begin{array}{r} -17 \\ \underline{-\ 5} \end{array}$ In the following frames you will be given subtraction problems similar to the one in the example. Subtract the bottom number from the one above it and then write the answer underneath the line. Remember to change the ________ of the number to be subtracted and then add the number above it.	sign
344. Subtract $\begin{array}{r} -17 \\ \underline{-\ 5} \end{array}$	-12

345. Subtract $\begin{array}{r} 13 \\ \underline{-5} \end{array}$	18
346. Subtract $\begin{array}{r} 25 \\ \underline{3} \end{array}$	22
347. Subtract $\begin{array}{r} -25 \\ \underline{-30} \end{array}$	5
348. Subtract $\begin{array}{r} -6 \\ \underline{18} \end{array}$	−24
349. Subtract $\begin{array}{r} 3 \\ \underline{8} \end{array}$	−5
350. Subtract $\begin{array}{r} 32 \\ \underline{-5} \end{array}$	37
351. Subtract $\begin{array}{r} -8 \\ \underline{-15} \end{array}$	7
352. $(-7)-(-3)=(-7)+(+3)=-7+3=$ ________	−4
353. Find the integer which is equal to $(7-3-5)-(2-4)$. Hint: First find the values of $(7-3-5)$ and $(2-4)$. Then subtract the second from the first of these numbers.	$(7-3-5)-(2-4)$ $=(7-8)-(-2)$ $=-1-(-2)$ $=-1+2$ $=1$
354. What integer is equal to $(-3-5+1)-(3+2)$? ________	$(-3-5+1)-(3+2)$ $=(-8+1)-(5)$ $=(-7)-(5)$ $=-7-5$ $=-12$

355. Recall that the product of two real numbers is ______ if the numbers are of the same sign, and negative if the numbers are of opposite signs.	positive
356. The quotient of two real numbers behaves in a similar manner. If two real numbers have like signs, then their quotient is positive. If two real numbers have opposite signs, then their quotient is ______	negative
357. To divide two real numbers, first divide their absolute values. Give the quotient of the absolute values a plus sign if the two numbers have the same sign. If the two numbers have opposite signs, make the quotient of their ______ values negative.	absolute
358. −9 and 3 have opposite signs. If −9 is divided by 3, then the quotient will be the negative number ______	−3
359. $(-6)\div(-2)$ is equal to ______	3
360. $\frac{-8}{-4}=$ ______	2
361. $\frac{8}{-4}=$ ______	−2
362. $\frac{-8}{4}=$ ______	−2
363. $\frac{-12}{3}=$ ______	−4
364. $\frac{-12}{-3}=$ ______	4
365. $\frac{12}{-3}=$ ______	−4

MATHEMATICS - ALGEBRA

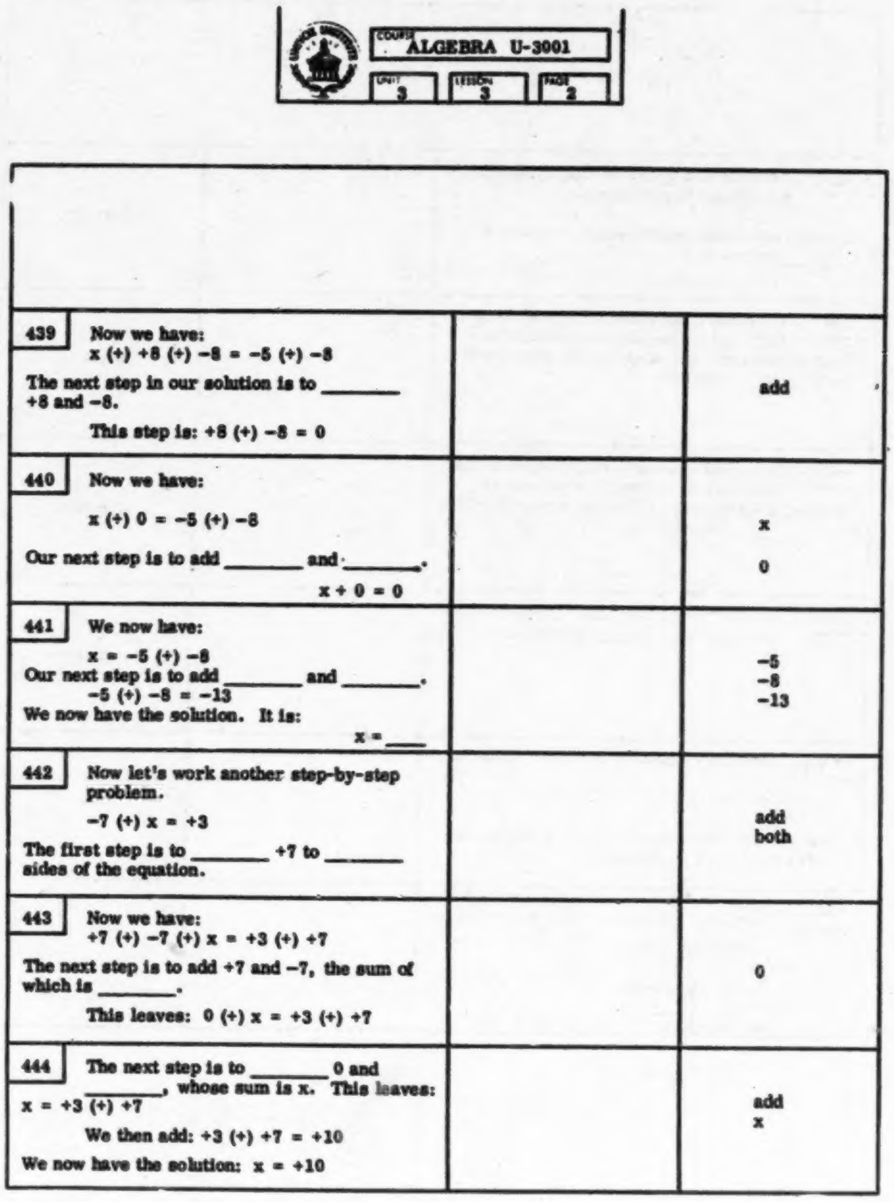
ALGEBRA U-3001
UNIVOX INSTITUTE, INC.
Published by UNIVERSAL ELECTRONICS
LABORATORIES CORP.,
510 Hudson Street, Hackensack, N. J.

Programed text, 2160 frames, Paperback, 360 pp., $8\frac{1}{2}$" X 11", $14.95.
For use in Univox Model "U" Teaching Machine; program reusable.
Teacher's Manual not available.
Constructed Responses usually used; some Multiple Choice; no Branching.

No Additional Materials required.
Time Required to Complete program: "36 to 45 hours" (based partly on data).
Student Data being used for revision.
(two sample pages)

MATHEMATICS - ALGEBRA

ALGEBRA U-3001
Univox Institute, Inc.; UNIVERSAL ELECTRONICS LABORATORIES
two sample pages:



COURSE ALGEBRA U-3001
UNIT 3 LESSON 3 PAGE 2

439 Now we have: x (+) +8 (+) −8 = −5 (+) −8 The next step in our solution is to ________ +8 and −8. This step is: +8 (+) −8 = 0		add
440 Now we have: x (+) 0 = −5 (+) −8 Our next step is to add ________ and ________. x + 0 = 0		x 0
441 We now have: x = −5 (+) −8 Our next step is to add ________ and ________. −5 (+) −8 = −13 We now have the solution. It is: x = ____		−5 −8 −13
442 Now let's work another step-by-step problem. −7 (+) x = +3 The first step is to ________ +7 to ________ sides of the equation.		add both
443 Now we have: +7 (+) −7 (+) x = +3 (+) +7 The next step is to add +7 and −7, the sum of which is ________. This leaves: 0 (+) x = +3 (+) +7		0
444 The next step is to ________ 0 and ________, whose sum is x. This leaves: x = +3 (+) +7 We then add: +3 (+) +7 = +10 We now have the solution: x = +10		add x

457 Addition in algebra is roughly similar to addition in arithmetic. A negative number plus a negative equals a ________ number.		negative
458 If we add a negative and a positive number, and, if the negative number is larger, then the sum of the two numbers will be a ________ number.		negative
459 If we add a positive and a negative number, and, if the positive number is larger, then the sum of the two numbers will be a ________ number.		positive
460 A positive number plus a positive number equals a ________ number.		positive
461 Now let's solve for x in this equation. $+3 \cdot x\ (+)\ -2\ (-)\ -3 = +5\ (-)\ -2$ Our general rule for solving for x (is / is not) to get x by itself on one side.		is
462 First, we'll do the obvious addition problems on each side, to shorten the equation. On the left side: $+3 \cdot x\ (+)\ -2\ (-)\ -3 = 3 \cdot x\ (+)$ ________ On the right side: $+5\ (-)\ -2 =$ ________ We then have $+3 \cdot x\ (+0 +1 = +7)$		+1 +7

MATHEMATICS - ALGEBRA

INTERMEDIATE MATHEMATICS SERIES: FUNDAMENTALS OF ALGEBRA Part I High School
CHARLOTTE YESSELMAN, Programer, TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

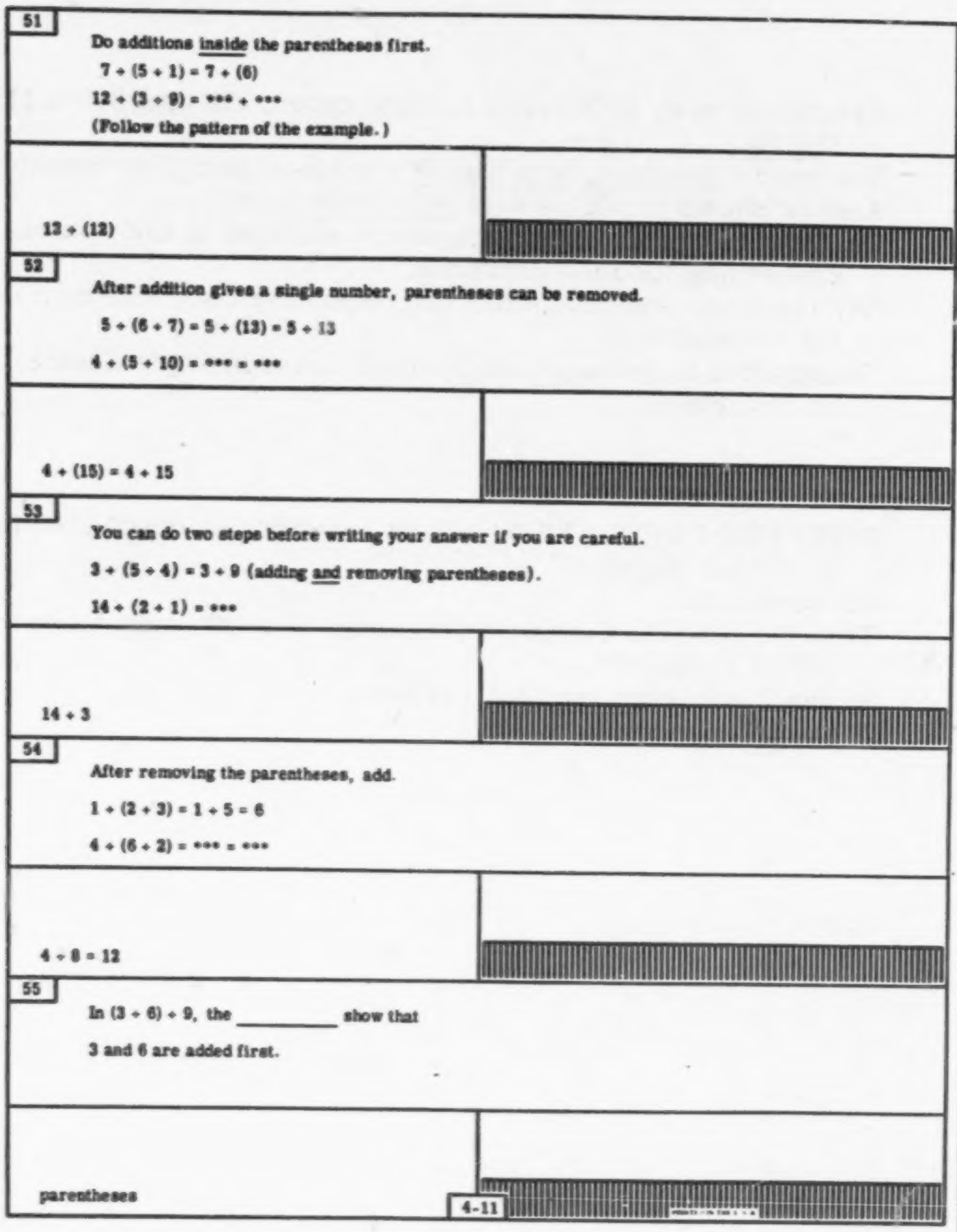
Programed text, 2000 frames, Vinyl cover, 250 pp., $8\frac{1}{2}$" X 11", $10.00.
For use in Min/Max, Min/Max II machines; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
"No tests are available other than those enclosed with course"; not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "First semester students studying first year Algebra."
Prerequisites:
Time Required to Complete program: 15 to 20 hours (based solely on data).
Student Data being used for revision.
(2 sample pages)

MATHEMATICS - ALGEBRA

INTERMEDIATE MATHEMATICS SERIES: FUNDAMENTALS OF ALGEBRA Part I

Yesselman; TMI-GROLIER
2 sample pages:



51

Do additions inside the parentheses first.

7 + (5 + 1) = 7 + (6)

12 + (3 + 9) = *** + ***

(Follow the pattern of the example.)

13 + (12)

52

After addition gives a single number, parentheses can be removed.

5 + (6 + 7) = 5 + (13) = 5 + 13

4 + (5 + 10) = *** = ***

4 + (15) = 4 + 15

53

You can do two steps before writing your answer if you are careful.

3 + (5 + 4) = 3 + 9 (adding and removing parentheses).

14 + (2 + 1) = ***

14 + 3

54

After removing the parentheses, add.

1 + (2 + 3) = 1 + 5 = 6

4 + (6 + 2) = *** = ***

4 + 8 = 12

55

In (3 + 6) + 9, the __________ show that

3 and 6 are added first.

parentheses

4-11

16

In 17r, r is the coefficient of 17.

In 36c, *** is the coefficient of c.

36

17

If a product has a single arithmetic number for a factor, that number is called a NUMERICAL COEFFICIENT of the other factors. In 3r, 3 is the __________ __________ of r.

The numerical coefficient of 78x is ***.

numerical coefficient 78

18

A numerical coefficient can be a fraction.

In $\frac{1}{3}$ x, the numerical coefficient is $\frac{1}{3}$.

What is the numerical coefficient in $\frac{1}{7}$x? ***

$\frac{1}{7}$

19

In $\frac{3}{5}$x, $\frac{3}{5}$ is the __________ __________

numerical coefficient

20

$\frac{1}{2}$x can be written $\frac{1 \cdot x}{2}$ or $\frac{x}{2}$.

Similarly, $\frac{x}{2}$ can be written $\frac{1}{2}$x.

Write $\frac{x}{3}$ with a fractional coefficient. ***

$\frac{1}{3}$x

MATHEMATICS - ALGEBRA

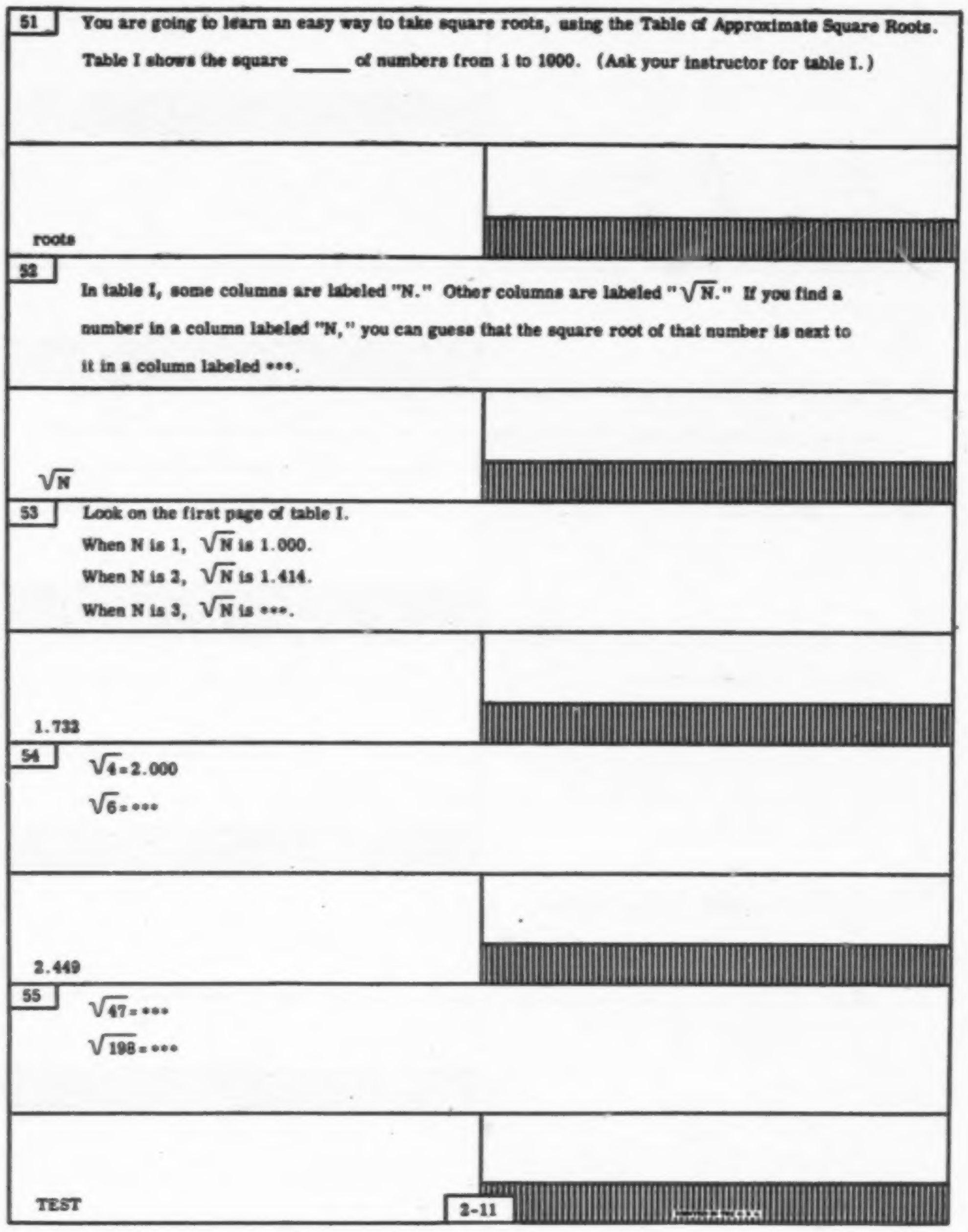
INTERMEDIATE MATHEMATICS SERIES: FUNDAMENTALS OF ALGEBRA Part II High School
CHARLOTTE YESSELMAN,
POLO C. de BACA,
DONALD T. TOSTI,
GAYLA GLASCOCK,
DONALD BERTHOLOMEY, Programers, TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 4400 frames, Vinyl cover, 880 pp., 8½" X 11", $15.00.
For use in Min/Max, Min/Max II machine; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
"No tests available other than those enclosed with course"; not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "Second semester students studying first year Algebra; review for students in higher grades and adults."
Prerequisites:
No Additional Material required.
Time Required to Complete program: 35 to 50 hours (based solely on data).
Student Data being used for revision.
(4 sample pages)

MATHEMATICS - ALGEBRA

INTERMEDIATE MATHEMATICS SERIES:
FUNDAMENTALS OF ALGEBRA Part II
Yesselman, de Baca, Tosti, Glascock, Bertholomey;
TMI-GROLIER
4 sample pages:



51 You are going to learn an easy way to take square roots, using the Table of Approximate Square Roots.

Table I shows the square _____ of numbers from 1 to 1000. (Ask your instructor for table I.)

roots

52 In table I, some columns are labeled "N." Other columns are labeled "$\sqrt{N}$." If you find a number in a column labeled "N," you can guess that the square root of that number is next to it in a column labeled •••.

$\sqrt{N}$

53 Look on the first page of table I.

When N is 1, $\sqrt{N}$ is 1.000.
When N is 2, $\sqrt{N}$ is 1.414.
When N is 3, $\sqrt{N}$ is •••.

1.732

54 $\sqrt{4}=2.000$
$\sqrt{6}=$ •••

2.449

55 $\sqrt{47}=$ •••
$\sqrt{198}=$ •••

TEST

2-11

246

$\sqrt{\frac{16}{9x^2}} = \frac{\sqrt{16}}{\sqrt{9x^2}} = \frac{4}{3x} \qquad \sqrt{\frac{25y^4}{36x^2}} = \frac{\sqrt{25y^4}}{\sqrt{36x^2}} = \cdots$

$\frac{5y^2}{6x}$

247

$\frac{\sqrt{64}}{\sqrt{4}} = \frac{8}{2} = 4 \qquad \sqrt{\frac{64}{4}} = \sqrt{16} = 4$

In other words, $\frac{\sqrt{64}}{\sqrt{4}} = \sqrt{\frac{\cdots}{\cdots}}$

$\sqrt{\frac{64}{4}}$

$\sqrt{\frac{\quad}{\quad}}$

248 If the expression under the square root sign is a perfect square, you may leave off the square root sign only after taking the square root of the expression. $9x^2$ is a perfect square, so you can express $\sqrt{9x^2}$ as $3x$. You cannot express $\sqrt{9x^2}$ as just $9x^2$. Express $\sqrt{16y^2}$ without the square root sign. •••

4y

249 If the expression under the square root sign is a perfect square, and you write its square root, you do not use the square root sign.

$\sqrt{9} = 3$; it is not $= \sqrt{3}$. $\qquad \sqrt{25} = \cdots$

5

250 $\sqrt{16x^2} =$ ($\sqrt{4x}$/4x/4 $\sqrt{x}$/None of these)

4x

3-50

96 In some fractions it may be necessary to factor before we can cancel.

$$\frac{2a+2b}{2}=\frac{2(a+b)}{2}=\frac{\cancel{2}(a+b)}{\cancel{2}}=a+b$$

(removing a common monomial factor) (cancelling) (reducing)

$$\frac{5c+5d}{c+d}=\cdots=\cdots$$ (factoring, cancelling, and reducing)

$$\frac{5c+5d}{c+d}=\frac{5\cancel{(c+d)}}{\cancel{(c+d)}}=5$$

97 Factor this fraction and reduce to lowest terms.

$$\frac{3x^2+5x}{3x}=\cdots$$

Did you factor first?

$$\frac{\cancel{x}(3x+5)}{3\cancel{x}}=\frac{3x+5}{3}$$

98 Factor and reduce: $\frac{7b+7a}{ca+cb}=\cdots$

$$\frac{7\cancel{(b+a)}}{c\cancel{(a+b)}}=\frac{7}{c}$$

99 Factor and reduce: $\frac{2ax+2ay}{(x+y)}=\cdots$

$$\frac{2a\cancel{(x+y)}}{\cancel{(x+y)}}=2a$$

100 Factor and reduce if possible.

A. $\frac{5a-15b}{10az}=\cdots$ B. $\frac{4b+8c}{9bc}=\cdots$

A. $\frac{\cancel{5}(a-3b)}{\underset{2}{\cancel{10}}az}=\frac{a-3b}{2az}$ B. $\frac{4(b+2c)}{9bc}$

A. B.

6-20

526

The L. C. D. of $\frac{3}{7\cdot 5r^3} - \frac{5}{7\cdot 2rs}$ is $7\cdot 5\cdot 2\cdot r^3\cdot s$. The denominator of $\frac{3}{7\cdot 5\cdot r^3}$ does not have the factors 2 and s which are found in the L. C. D. The denominator of $\frac{5}{7\cdot 2\cdot r\cdot s}$ does not have the factors r^3 and ••• which are found in the L. C. D.

5

527

The L. C. D. of $\frac{1}{2\cdot 5} + \frac{1}{5\cdot 3}$ is $2\cdot 3\cdot 5$. We must multiply the numerator and denominator of $\frac{1}{2\cdot 5}$ by 3, the missing factor, to get a like fraction: $\frac{1\cdot 3}{2\cdot 5\cdot 3} = \frac{3}{2\cdot 5\cdot 3}$. $\frac{1\cdot \bullet\bullet\bullet}{5\cdot 3\cdot \bullet\bullet\bullet} = \frac{2}{2\cdot 5\cdot 3}$

What factor of the L. C. D. was missing in the denominator of $\frac{1}{5\cdot 3}$? •••

$\frac{1\cdot 2}{5\cdot 3\cdot 2} = \frac{2}{2\cdot 5\cdot 3}$

528

The L. C. D. of $\frac{1}{7\cdot 3^3\cdot y} + \frac{1}{2\cdot x^3}$ is $7\cdot 3^3\cdot 2\cdot x^3\cdot y$.

$\frac{1\cdot 2x^3}{7\cdot 3^3\cdot y\cdot 2x^3} = \frac{2x^3}{7\cdot 3^3\cdot 2\cdot x^3\cdot y}$ $\frac{1\cdot \bullet\bullet\bullet}{2x^3\cdot \bullet\bullet\bullet} = \frac{7\cdot 3^3\cdot y}{7\cdot 3^3\cdot 2\cdot x^3\cdot y}$

(missing factors) (missing factors)

$\frac{1\cdot 7\cdot 3^3\cdot y}{2x^3\cdot 7\cdot 3^3\cdot y} = \frac{7\cdot 3^3\cdot y}{7\cdot 3^3\cdot 2\cdot x^3\cdot y}$

529

$\frac{3}{a^2bc^3} - \frac{4}{a^3bc^2}$ L. C. D. $= a^3bc^3$

$\frac{3\cdot a}{a^2bc^3\cdot a} = \frac{3a}{a^3bc^3}$ $\frac{4\cdot \bullet\bullet\bullet}{a^3bc^2\cdot \bullet\bullet\bullet} = \frac{\bullet\bullet\bullet}{a^3bc^3}$

(missing factor(s))

$\frac{4\cdot c}{a^3bc^2\cdot c} = \frac{4c}{a^3bc^3}$

530

What method would you use to add: $\frac{3}{5y}$ and $\frac{4}{10y^2}$? ____________________________

L. C. D.

6-106

MATHEMATICS - ALGEBRA

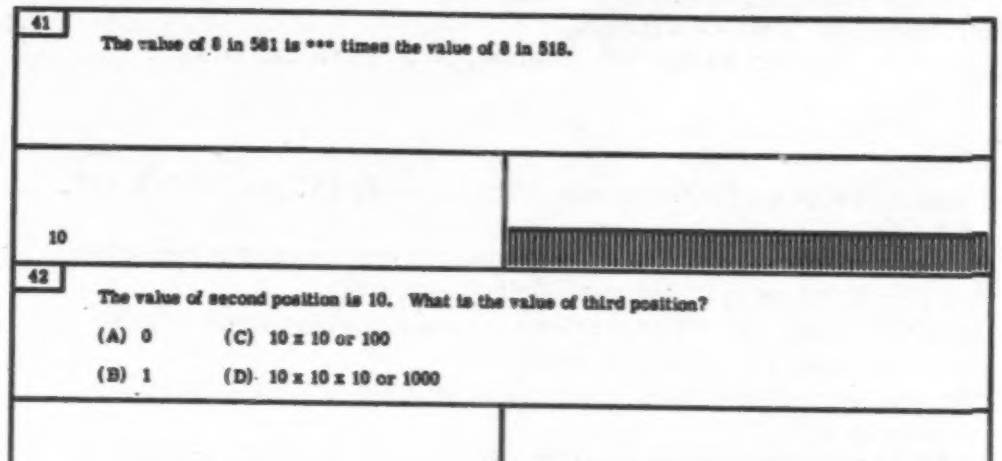
INTERMEDIATE MATHEMATICS SERIES: INTRODUCTION TO MODERN MATHEMATICS I Jr. - Sr. H.S.
CHARLOTTE YESSELMAN,
PAUL THOMAS,
NORMA LAW, Programers, TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 1000 frames, Vinyl cover, 250 pp., $8\frac{1}{2}$" X 11", $ (?) .
For use in Min/Max, Min/Max II machines; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
"No tests available other than those enclosed with course"; not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "Junior and Senior High School."
Prerequisites:
No Additional Material required.
Time Required to Complete program: 12 to 16 hours (based solely on data).
Student Data being used for revision.
(one sample page)

MATHEMATICS - ALGEBRA

INTERMEDIATE MATHEMATICS SERIES:
INTRODUCTION TO MODERN MATHEMATICS I
Yesselman, Thomas, Law; TMI-GROLIER
one sample page:



41

The value of 8 in 581 is *** times the value of 8 in 518.

10

42

The value of second position is 10. What is the value of third position?

(A) 0 (C) 10 x 10 or 100
(B) 1 (D) 10 x 10 x 10 or 1000

(C) 10 x 10 or 100

43

The value of fourth position is *** x *** x *** = ***.

10 x 10 x 10 = 1000

44

The value of (fifth/first/sixth) position is 10 x 10 x 10 x 10 x 10.

TEST

45

PLACE VALUE TABLE

Complete the Table.

Number of place (or position)	5th	A = ***	3rd	B = ***	1st
Value of place (or position)	10 x 10 x 10 x 10	10 x 10 x 10	C = ***	10	D = ***

A. 4th C. 10 x 10
B. 2nd D. 1

A. C.
B. D.

2-9

MATHEMATICS - ARITHMETIC

390 ARITHMETIC FACTS

ASTRA Staff
Published by ASTRA CORPORATION,
31 Church Street, New London, Conn.

For use in AUTOSCORE machine; program reusable, 2700 frames, $40.00.
Program available on 8½" X 11½" cards @ $6.00 per section.
Answer Sheets and Teacher's Manual available.
Unit, Final, Diagnostic tests available.
Multiple Choice Responses always used; no Constructed Responses; no Branching

INTENDED POPULATION:
Prerequisites: None.
Additional Equipment required: AUTOSCORE.
Time Required to Complete program: (no data available.)
Student Data being used for revision.
(one sample page)

MATHEMATICS - ARITHMETIC

390 ARITHMETIC FACTS
Astra Staff; ASTRA
one sample page:

"2's" Table Addition

CORE ASTRA CORPORATION 31 CHURCH STREET NEW LONDON, CONNECTICUT Serial No 2E

7 + 1 =	7 +1	8 -- 7 -- 6
2 + 6 =	2 +6	9 -- 4 -- 8
1 + 8 =	1 +8	7 -- 8 -- 9
3 + 2 =	3 +2	1 -- 5 -- 6
5 + 1 =	5 +1	6 -- 5 -- 4
0 + 1 =	0 +1	0 -- 1 -- 10
9 + 2 =	9 +2	7 -- 18 -- 11
1 + 9 =	1 +9	10 -- 19 -- 9
3 + 2 =	3 +2	5 -- 1 -- 6
2 + 7 =	2 +7	5 -- 9 -- 14

Copyright 1961, ASTRA Corp.

MATHEMATICS - ARITHMETIC

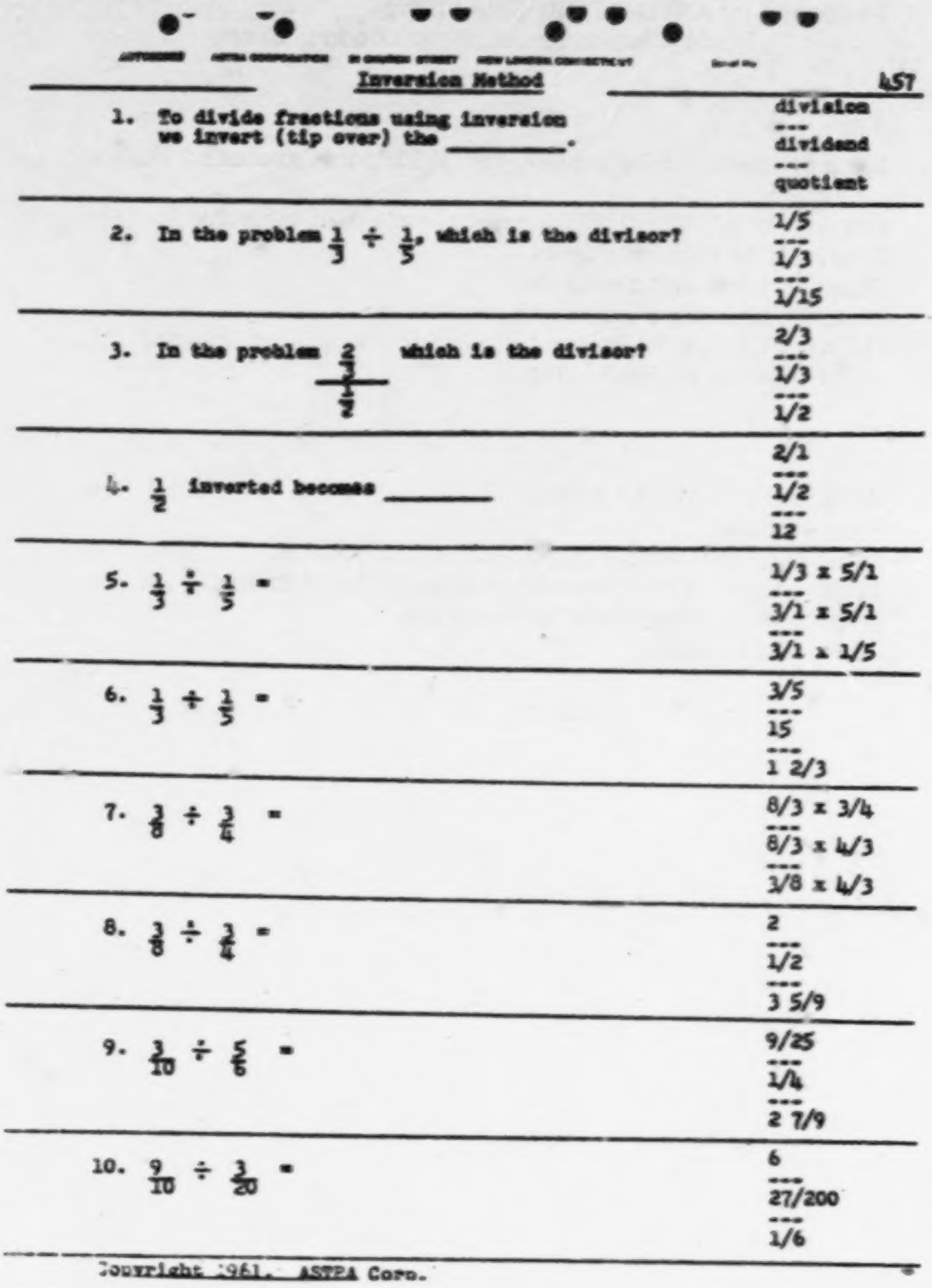
FRACTIONS, INTRODUCTION TO AND FUNCTION OF
ASTRA PROGRAMMING STAFF
Published by ASTRA CORPORATION,
31 Church Street, New London, Conn.

Pack of cards (680 frames), 8½" X 11", in Cardboard Boxes, $15.00.
For use in AUTOSCORE machine; program reusable.
Available in separate units.
Teacher's Manual available.
Unit, Final, Diagnostic tests available.
Multiple Choice Responses always used; no Constructed Responses or Branching.

INTENDED POPULATION:
Prerequisites:
Additional Equipment required: AUTOSCORE.
Time Required to Complete program: (no data available.)
Student Data being used for revision.
(one sample page)

MATHEMATICS - ARITHMETIC

FRACTIONS, INTRODUCTION TO AND FUNCTION OF
Astra Programming Staff; ASTRA
one sample page:



Inversion Method 457

1. To divide fractions using inversion we invert (tip over) the ________.	division --- dividend --- quotient
2. In the problem $\frac{1}{3} \div \frac{1}{5}$, which is the divisor?	1/5 --- 1/3 --- 1/15
3. In the problem $\dfrac{\frac{2}{3}}{\frac{1}{2}}$ which is the divisor?	2/3 --- 1/3 --- 1/2
4. $\frac{1}{2}$ inverted becomes ________	2/1 --- 1/2 --- 12
5. $\frac{1}{3} \div \frac{1}{5} =$	1/3 x 5/1 --- 3/1 x 5/1 --- 3/1 x 1/5
6. $\frac{1}{3} \div \frac{1}{5} =$	3/5 --- 15 --- 1 2/3
7. $\frac{3}{8} \div \frac{3}{4} =$	8/3 x 3/4 --- 8/3 x 4/3 --- 3/8 x 4/3
8. $\frac{3}{8} \div \frac{3}{4} =$	2 --- 1/2 --- 3 5/9
9. $\frac{3}{10} \div \frac{5}{6} =$	9/25 --- 1/4 --- 2 7/9
10. $\frac{9}{10} \div \frac{3}{20} =$	6 --- 27/200 --- 1/6

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MATHEMATICS - ARITHMETIC

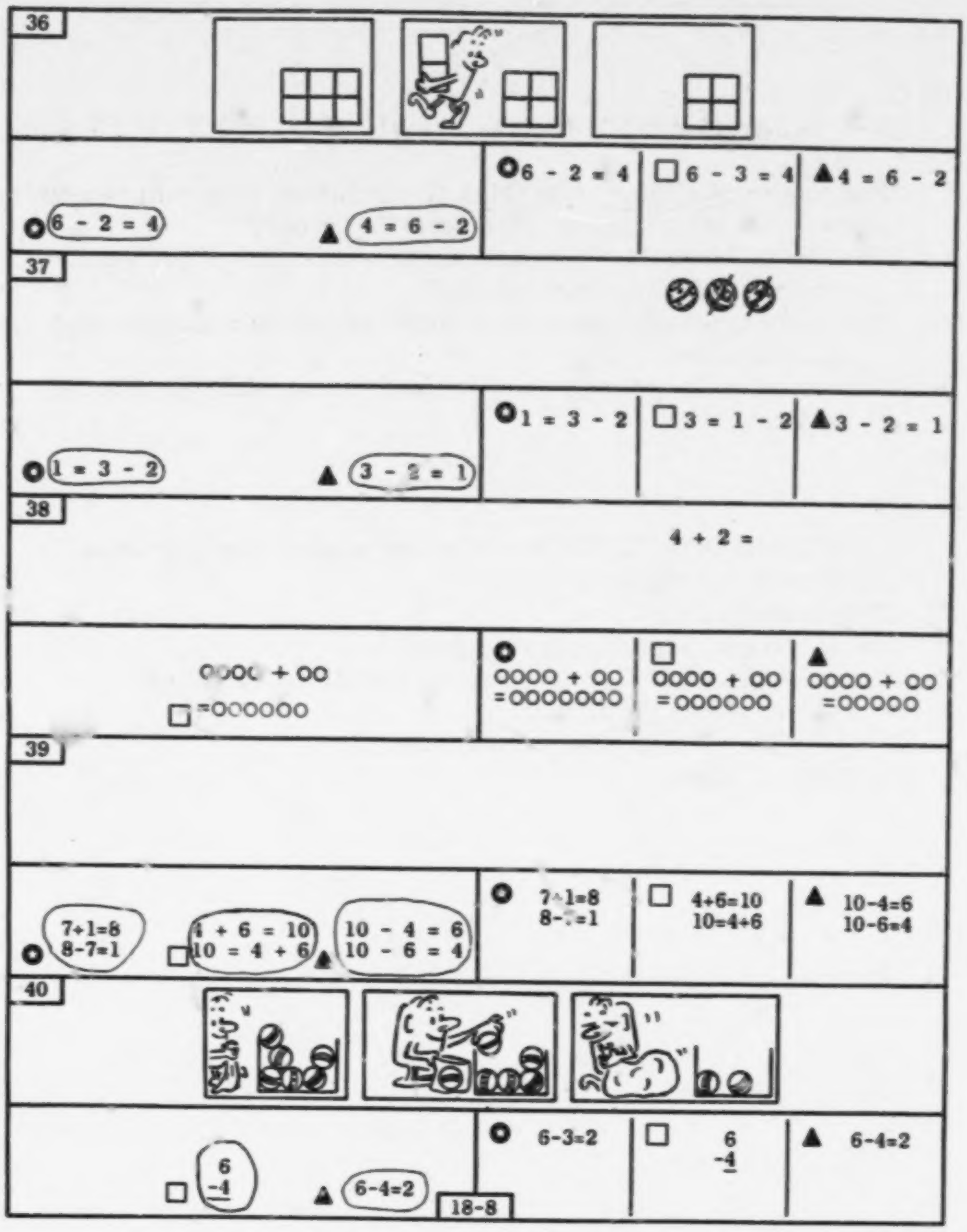
ELEMENTARY ARITHMETIC SERIES: Elementary
ADDITION AND SUBTRACTION
Facts of Sums from 0 through 10
DONALD BERTHOLOMEY, Programer, TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 1700 frames, Vinyl cover, $8\frac{1}{2}$" X 11", 340 pp., $ (?) .
For use in Min/Max, Min/Max II machines; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
"No tests available other than those enclosed with course," not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "Can be used in early grades. Review for higher grades."
Prerequisites:
No Additional Equipment required.
Time Required to Complete program: 12 to 16 hours (based solely on data.)
Student Data being used for revision.
(2 sample pages)

MATHEMATICS - ARITHMETIC

**ELEMENTARY ARITHMETIC SERIES:
ADDITION AND SUBTRACTION**
Bertholomey; TMI-GROLIER
2 sample pages:



36

○ 6 - 2 = 4 ▲ 4 = 6 - 2

○ 6 - 2 = 4 | ☐ 6 - 3 = 4 | ▲ 4 = 6 - 2

37

○ 1 = 3 - 2 ▲ 3 - 2 = 1

○ 1 = 3 - 2 | ☐ 3 = 1 - 2 | ▲ 3 - 2 = 1

38

4 + 2 =

oooo + oo
☐ =oooooo

○ oooo + oo =ooooooo | ☐ oooo + oo =oooooo | ▲ oooo + oo =ooooo

39

○ 7+1=8 8-7=1 ☐ 4 + 6 = 10 10 = 4 + 6 ▲ 10 - 4 = 6 10 - 6 = 4

○ 7+1=8 8-7=1 | ☐ 4+6=10 10=4+6 | ▲ 10-4=6 10-6=4

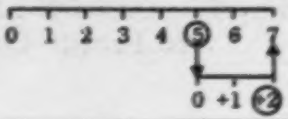
40

☐ 6 -4 ▲ 6-4=2

18-8

○ 6-3=2 | ☐ 6 -4 | ▲ 6-4=2

41

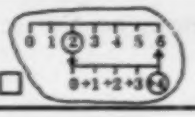


○ 5 + 2 = 7

○	□	▲
○ 5 + 2 = 7	□ 5 + 2 = 6	▲ 5 + 2 = 4

42

2 + 4
||+||||

□


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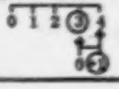

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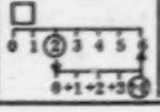

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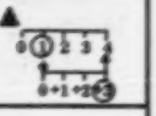
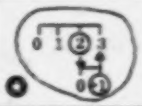


43

3

○


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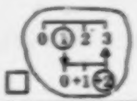

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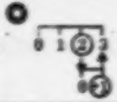

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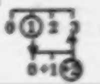

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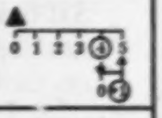
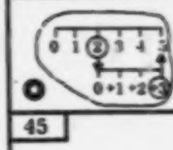


44

2 + 3

○


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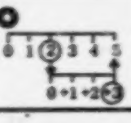

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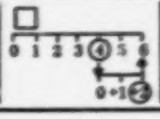

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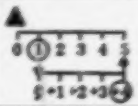
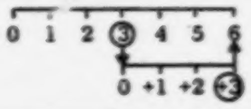


45



3 + 3 = ( )

□ 3 + 3 = 6

○	□	▲
○ 3 + 3 = 5	□ 3 + 3 = 6	▲ 3 + 3 = 7

6-9

MATHEMATICS - ARITHMETIC

ARITHMETIC 22

R. CLAYTON COURSEY, Vice-President,
Education Engineering, Inc.
Published by EDUCATION ENGINEERING, Inc.,
3810 Pacific Coast Highway, Torrance, Calif.

22,780 frames, for use in "SPEED" machine: $210; program reusable.

Programed text, Paperback, 756 pages, 5" X 7", 21 separate units @ $3.75 each.

Teacher's Manual available @ $4.00 per unit.

Unit, Final, Diagnostic tests available at $3.75 each; tests reusable.

Multiple Choice Responses are always used; no Constructed Responses; no Branching.

INTENDED POPULATION:

Prerequisites:

Additional Equipment required: "SPEED" teaching machine, $700 & $800.

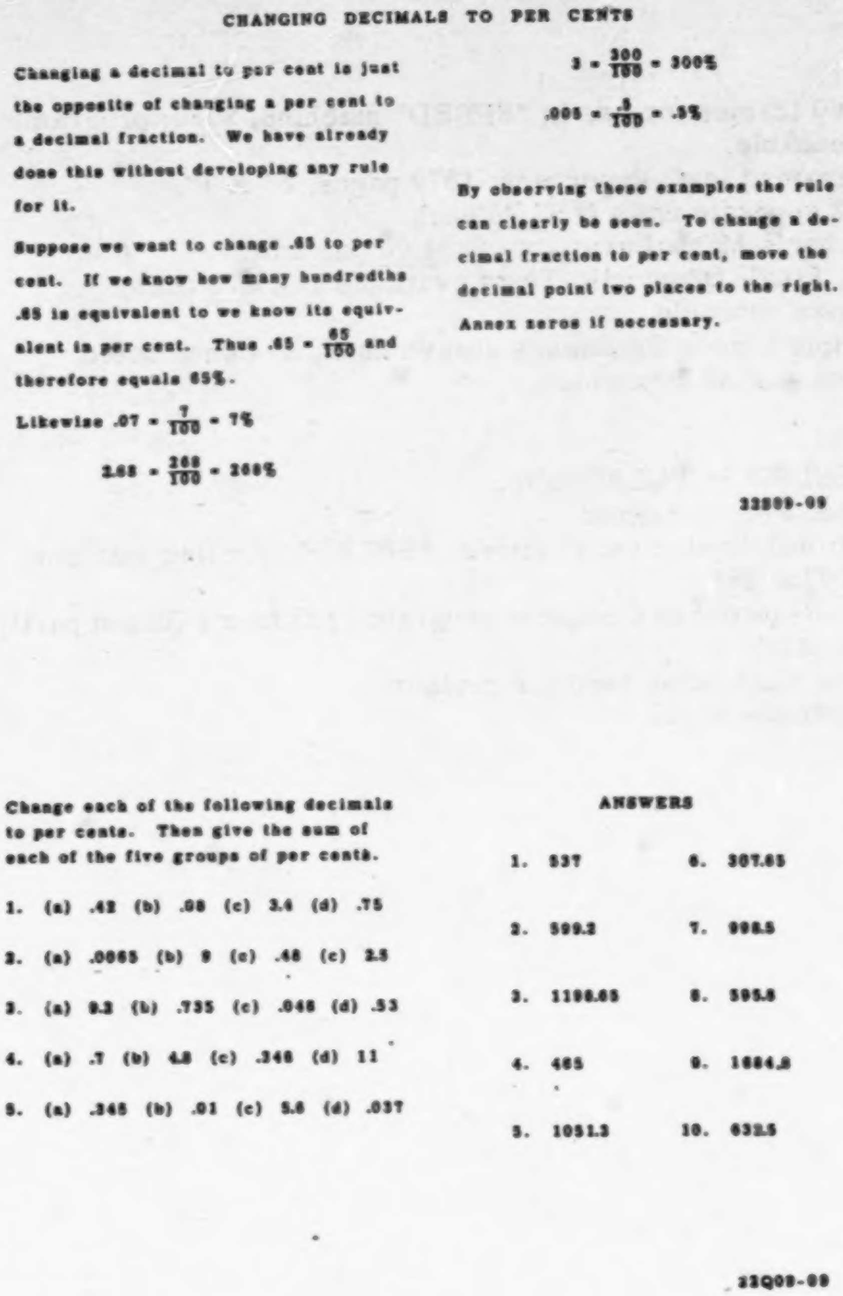
Time Required to Complete program: 50 hours (based partly on data)

Student Data being used for revision.

(one sample page)

MATHEMATICS - ARITHMETIC

ARITHMETIC 22
Coursey; EDUCATION ENGINEERING
one sample page:



CHANGING DECIMALS TO PER CENTS

Changing a decimal to per cent is just the opposite of changing a per cent to a decimal fraction. We have already done this without developing any rule for it.

Suppose we want to change .65 to per cent. If we know how many hundredths .65 is equivalent to we know its equivalent in per cent. Thus $.65 = \frac{65}{100}$ and therefore equals 65%.

Likewise $.07 = \frac{7}{100} = 7\%$

$2.68 = \frac{268}{100} = 268\%$

$3 = \frac{300}{100} = 300\%$

$.005 = \frac{.5}{100} = .5\%$

By observing these examples the rule can clearly be seen. To change a decimal fraction to per cent, move the decimal point two places to the right. Annex zeros if necessary.

22S09-09

Change each of the following decimals to per cents. Then give the sum of each of the five groups of per cents.

1. (a) .42 (b) .08 (c) 3.4 (d) .75
2. (a) .0065 (b) 9 (c) .48 (c) 2.5
3. (a) 9.2 (b) .735 (c) .046 (d) .53
4. (a) .7 (b) 4.8 (c) .348 (d) 11
5. (a) .345 (b) .01 (c) 5.6 (d) .037

ANSWERS

1. 537
2. 599.2
3. 1198.65
4. 465
5. 1051.3
6. 307.65
7. 998.5
8. 595.8
9. 1684.8
10. 632.5

22Q09-09

MATHEMATICS - ARITHMETIC

GENERAL MATHEMATICS 40 (Elem. +)
R. CLAYTON COURSEY, Vice-President, Education Engineering, Inc.
Published by EDUCATION ENGINEERING, Inc.,
3810 Pacific Coast Highway, Torrance, Calif.

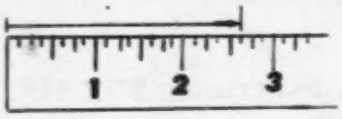
57,160 frames for use in "SPEED" machine, $520; program reusable.
Programed text, Paperback, 1872 pages, 5" X 7", 52 separate units @ $3.75 each.
Teacher's Manual available @ $4.00 per unit.
Unit, Final, Diagnostic Tests available at $3.75 each, tests reusable.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

INTENDED POPULATION:
Student Prerequisites:
Additional Equipment required: "SPEED" teaching machine, $700 & $850.
Time Required to Complete program: 125 hours (based partly on data)
Student Data being used for revision.
(one sample page)

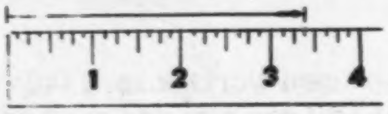
MATHEMATICS - ARITHMETIC

GENERAL MATHEMATICS 40
Coursey; EDUCATION ENGINEERING
one sample page:

CHANGING A MIXED NUMBER TO AN IMPROPER FRACTION



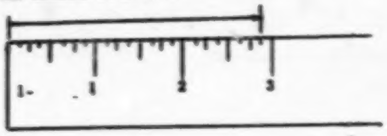
Suppose that an object measured $2\frac{5}{8}$ inches as shown on the scale above. If we should desire to change this mixed number to an improper fraction, a study of the scale will show that this measurement could also be shown as $\frac{8+8+5}{8}$ inches or $\frac{21}{8}$ inches.

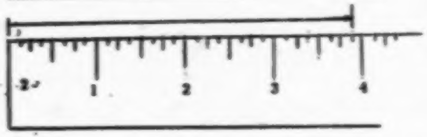


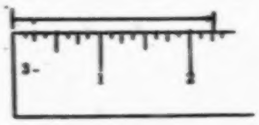
Likewise, the measurement above instead of being called $3\frac{3}{8}$ inches could be called $\frac{8+8+8+3}{8}$ inches or $\frac{27}{8}$ inches.

22S03 - 07

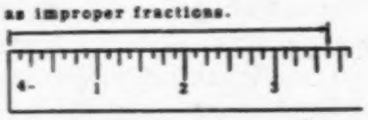
Determine the following measurements as mixed numbers.

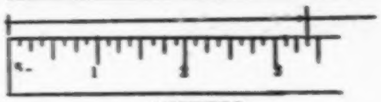






Determine the following measurements as improper fractions.





ANSWERS

1. $\frac{27}{8}$
2. $2\frac{3}{4}$
3. $2\frac{7}{8}$
4. $3\frac{7}{8}$
5. $3\frac{5}{8}$
6. $\frac{29}{8}$
7. $2\frac{1}{8}$
8. $2\frac{1}{4}$
9. $\frac{21}{4}$
10. $\frac{25}{8}$

22Q03 - 07

LOWER PRIMARY ARITHMETIC **Special Education**
A Set of 10 Automated Workbooks
Prepared through the facilities of
THE DEVEREUX FOUNDATION
Published by DEVEREUX TEACHING AIDS,
Box 717, Devon, Pennsylvania

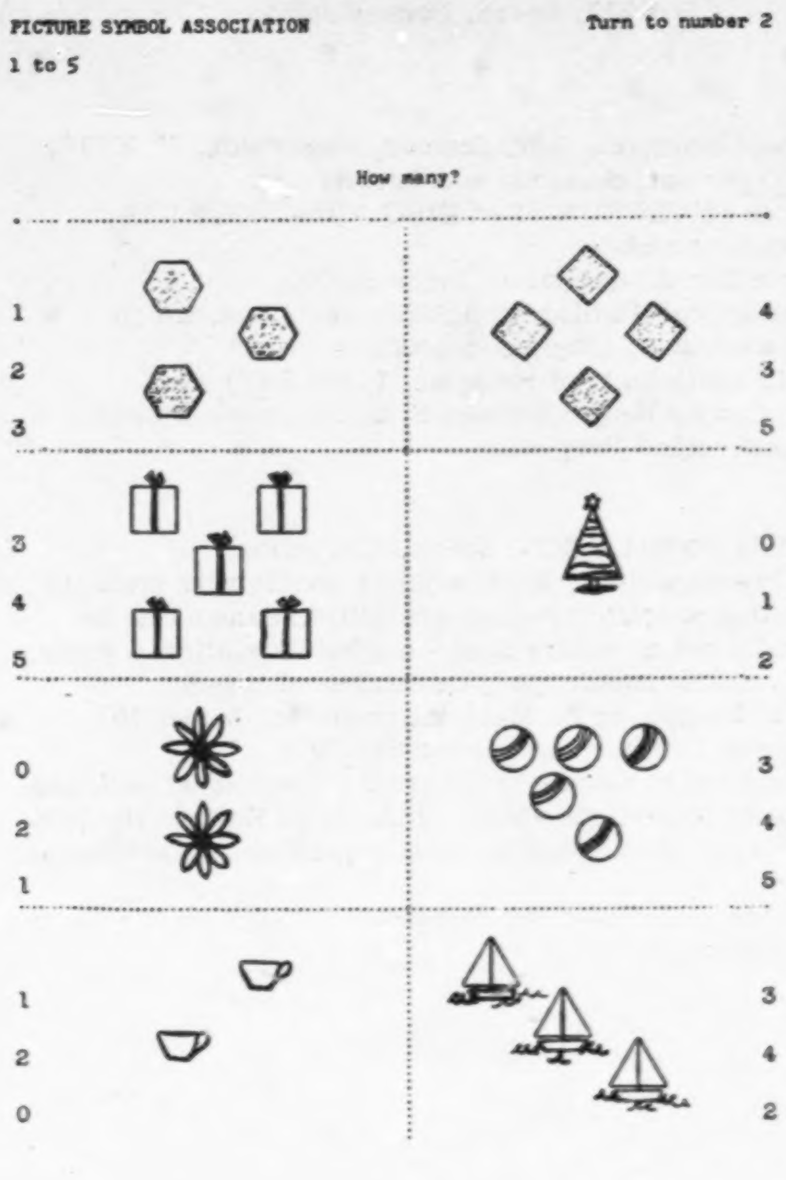
Programed workbooks, 1440 frames, Paperback, 7" X 11", $13.50 per set; designed specifically
For use in DEVEREUX TEACHING AID - MODEL 50; program reusable.
Teacher's Manual available, Price $1.00.
Unit tests available; not reusable; Price $ (?) .
Diagnostic Tests: "California Achievement Test used, which includes adequate diagnostic profile.
Multiple Choice Responses and Branching always used; no Constructed Responses.

INTENDED POPULATION: Special Education
Student Prerequisites: Most booklets usable with students exhibiting specific reading disabilities though this is naturally not a requirement - neither is ability to write, so physically handicapped can and do use them.
Additional Equipment or Material required:
Model 50 Devereux Teaching Aid, Price; $89.50.
Time Required to Complete program: Dependent on IQ and other factors; IQ of 70 and CA of 16 will usually finish a workbook in an hour. (based partly on data)
Student Data being used for revision.
(one sample page)

MATHEMATICS - ARITHMETIC

LOWER PRIMARY ARITHMETIC

The Devereux Foundation; DEVEREUX TEACHING AIDS
one sample page:



PICTURE SYMBOL ASSOCIATION **Turn to number 2**

1 to 5

How many?

1
2
3

4
3
5

3
4
5

0
1
2

0
2
1

3
4
5

1
2
0

3
4
2

MATHEMATICS - ARITHMETIC

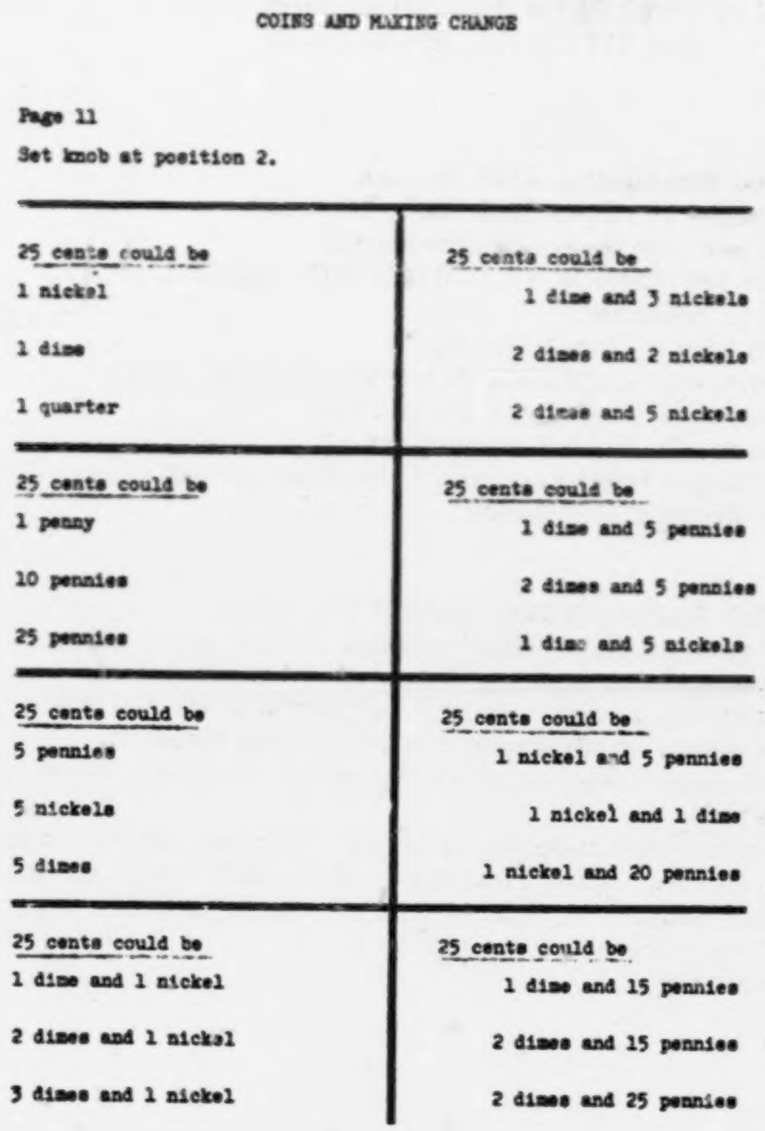
UPPER PRIMARY ARITHMETIC Special Education
A set of 13 Automated Workbooks
Prepared through the facilities of
THE DEVEREUX FOUNDATION.
Published by DEVEREUX TEACHING AIDS,
Box 717, Devon, Pennsylvania.

Programed workbook, 1872 frames, Paperback, 7" X 11", $17.50 per set, designed specifically
For use in DEVEREUX TEACHING AID - MODEL 50; program reusable.
Teacher's Manual available, Price $1.00.
Coordinated with California Achievement Test, which includes adequate diagnostic profile.
Unit tests available; not reusable, Price $ (?) .
Multiple Choice Responses and Branching always used; no Constructed Responses.

INTENDED POPULATION: Special Education.
Student Prerequisites: Most booklets usable with students exhibiting specific reading disabilities though this is naturally not a requirement - neither is ability to write, so physically handicapped can and do use them.
Additional Equipment or Material required: Model 50 Devereux Teaching Aid, Price $89.50.
Time Required to Complete program : "Dependent on IQ and nature of limitations. Many students go through the book in one hour but require several repetitions on subsequent days."
Student Data being used for revision.
(one sample page)

MATHEMATICS - ARITHMETIC

UPPER PRIMARY ARITHMETIC
The Devereux Foundation; DEVEREUX TEACHING AIDS
one sample page:



COINS AND MAKING CHANGE

Page 11

Set knob at position 2.

25 cents could be 1 nickel 1 dime 1 quarter	25 cents could be 1 dime and 3 nickels 2 dimes and 2 nickels 2 dimes and 5 nickels
25 cents could be 1 penny 10 pennies 25 pennies	25 cents could be 1 dime and 5 pennies 2 dimes and 5 pennies 1 dime and 5 nickels
25 cents could be 5 pennies 5 nickels 5 dimes	25 cents could be 1 nickel and 5 pennies 1 nickel and 1 dime 1 nickel and 20 pennies
25 cents could be 1 dime and 1 nickel 2 dimes and 1 nickel 3 dimes and 1 nickel	25 cents could be 1 dime and 15 pennies 2 dimes and 15 pennies 2 dimes and 25 pennies

MATHEMATICS - ARITHMETIC

ADDITION AND SUBTRACTION
Special Education
A set of 11 Automated Workbooks
Prepared through the facilities of
THE DEVEREUX FOUNDATION
Published by DEVEREUX TEACHING AIDS,
Box 717, Devon, Pennsylvania

Programed Workbooks, 1584 frames,
Paperback, 18 pages each book, 7" X 11",
$15.00 per set; designed specifically
For use in DEVEREUX TEACHING AID - MODEL 50;
program reusable.
Teacher's Manual available, $1.00.
Coordinated with California Achievement Test, which
includes adequate diagnostic profile.
Unit tests available; not reusable, $ (?) .
Multiple Choice Responses and Branching always used;
no Constructed Responses.

INTENDED POPULATION: Special Education.
Student Prerequisites: Most booklets usable with students
exhibiting specific reading disabilities though this is
naturally not a requirement - neither is ability to write,
so physically handicapped can and do use them.
Additional Equipment required: Model 50 Devereux Teaching
Aid, $89.50.
Time Required to Complete program : Depends on IQ and nature
of limitations. Many students go through the book in one
hour but require several repetitions on subsequent days.
Student Data being used for revision.
(one sample page)

ADDITION AND SUBTRACTION

The Devereux Foundation; DEVEREUX TEACHING AIDS
one sample page:

UNDERSTANDING ADDITION Turn to number 9

Book II

5 and 7 more are 12 13 14	6 and 7 more are 11 12 13
7 and 7 more are 14 13 12	7 and 3 more are 12 11 10
7 and 2 more are 9 10 11	4 and 7 more are 10 11 12
7 and 0 more are 8 0 7	7 and 1 more are 7 8 9

MATHEMATICS - ARITHMETIC

Special Education

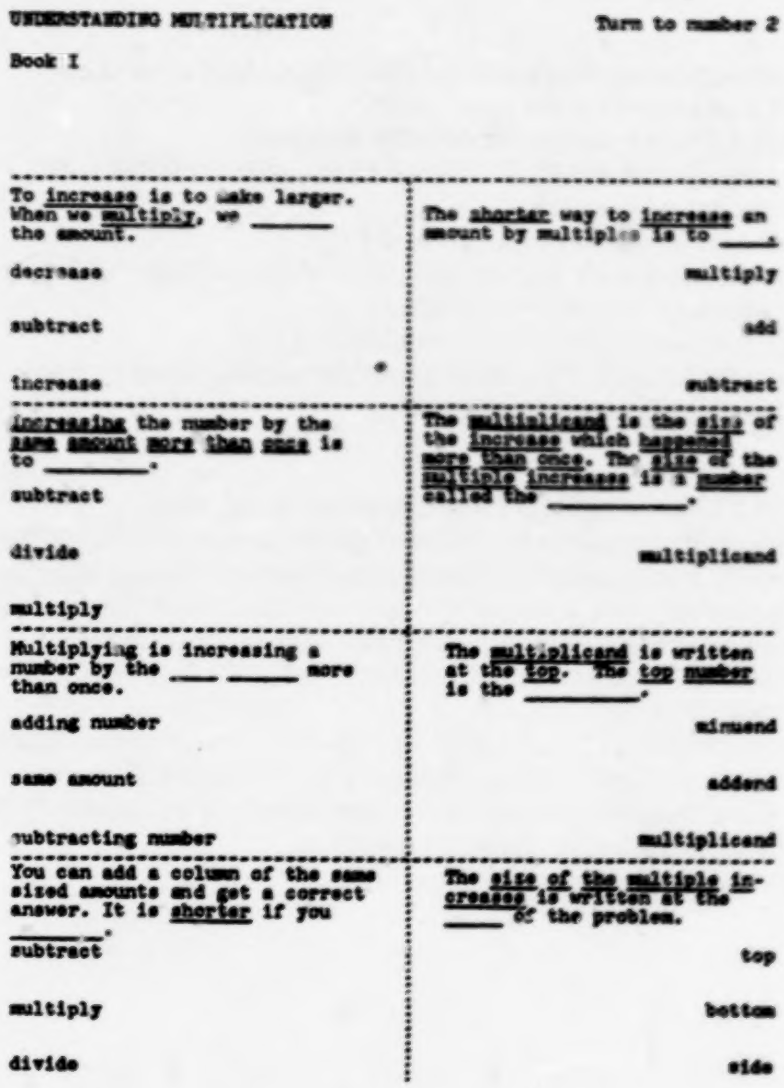
MULTIPLICATION and DIVISION
A set of 9 Automated Workbooks
Prepared through the facilities of
THE DEVEREUX FOUNDATION
Published by DEVEREUX TEACHING AIDS,
Box 717, Devon, Pennsylvania

9 Programed Workbooks, 1296 frames, Paperback, 18 pages each book, 7" X 11", $12.50 per set, designed specifically
For use in DEVEREUX TEACHING AID - MODEL 50; program reusable.
Teacher's Manual available, $1.00.
Coordinated with California Achievement Test, which includes adequate diagnostic profile.
Unit tests available; not reusable, $ (?).
Multiple Choice Responses and Branching always used; no Constructed Responses.

INTENDED POPULATION: Special Education.
Student Prerequisites: Most booklets usable with students exhibiting specific reading disabilities though this is naturally not a requirement - neither is ability to write, so physically handicapped can and do use them.
Additional Equipment required: Model 50 Devereux Teaching Aid, $89.50.
Time Required to Complete program: "Depends on IQ and nature of limitations. Many students go through the book in one hour but require several repetitions on subsequent days."
Student Data being used for revision.
(one sample page)

MATHEMATICS - ARITHMETIC

MULTIPLICATION and DIVISION
The Devereux Foundation; DEVEREUX TEACHING AIDS
one sample page:



UNDERSTANDING MULTIPLICATION — Turn to number 2

Book I

To increase is to make larger. When we multiply, we ______ the amount. decrease subtract increase	The shorter way to increase an amount by multiples is to ____. multiply add subtract
Increasing the number by the same amount more than once is to ________. subtract divide multiply	The multiplicand is the size of the increase which happened more than once. The size of the multiple increases is a number called the __________. multiplicand
Multiplying is increasing a number by the ____ _____ more than once. adding number same amount subtracting number	The multiplicand is written at the top. The top number is the ________. minuend addend multiplicand
You can add a column of the same sized amounts and get a correct answer. It is shorter if you ______. subtract multiply divide	The size of the multiple increases is written at the ____ of the problem. top bottom side

MATHEMATICS - ARITHMETIC

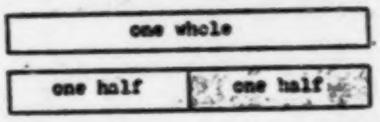
FRACTIONS Special Education
A set of 14 Automated Workbooks
Prepared through the facilities of
THE DEVEREUX FOUNDATION
Published by DEVEREUX TEACHING AIDS,
Box 717, Devon, Pennsylvania

14 Programed Workbooks, 2016 frames, Paperback,
18 pages each book, 7" X 11";
$18.50 per set, specifically designed
For use in DEVEREUX TEACHING AID - MODEL 50;
program reusable.
Teacher's Manual available, $1.00.
Coordinated with California Achievement Test, which includes
adequate diagnostic profile.
Unit tests available; not reusable, $ (?) .
Multiple Choice Responses and Branching always used;
no Constructed Responses.

INTENDED POPULATION: Special Education.
Student Prerequisites: "Most booklets usable with students exhibiting specific reading disabilities though this is naturally not a requirement - neither is ability to write, so physically handicapped can and do use them."
Additional Equipment required: Model 50 Devere Teaching Aid, $89.50.
Time Required to Complete program: "Depends on IQ and nature of limitations. Many students go through the book in one hour but require several repetitions on subsequent days."
Student Data being used for revision.
(one sample page)

MATHEMATICS - ARITHMETIC

FRACTIONS
The Devereux Foundation; DEVEREUX TEACHING AIDS
one sample page:



Set at position 8

Look at the chart at the top of the page. The top strip is one half one whole one fourth	Two halves are as long as one whole two wholes four wholes
The second strip is divided into ____ equal parts. four six two	Each part in the bottom strip is one half one third one fourth
The second strip is divided into thirds fourths halves	How many parts in the bottom strip are shaded? two three one
The whole is as long as ____ halves. 1 2 3	In the bottom strip ____ is shaded. 2/2 1/2

MATHEMATICS - ARITHMETIC

FRACTIONS I Elementary
JAMES V. DEVINE, GPTC, consulting with
DR. FRANK C. GENTRY
Published by GENERAL PROGRAMMED TEACHING
CORPORATION,
1719 Girard NE, Albuquerque, New Mexico

Programed text, 2092 frames, Paperback, 8½" X 11", 419 pp., $ (?) .
For use in GPTC and TMI machines; program reusable.
Teacher's Manual: "...Instructions to the teachers are included in the preface of the program."
Diagnostic tests: "Standardized achievement tests in arithmetic are available."
Constructed and Multiple Choice Responses usually used; no Branching.

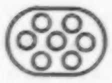
INTENDED POPULATION: "5th and 6th graders."
Prerequisites: "4th grade reading level; knowledge of addition, subtraction, multiplication, and division of whole numbers.
No Additional Material required.
Time Required to Complete program: 20 to 25 hours (based solely on data).
Student Data being used for revision.
(2 sample pages)

MATHEMATICS - ARITHMETIC

FRACTIONS I
Devine, Gentry; GENERAL PROGRAMMED TEACHING CORPORATION
2 sample pages:

871) **[175]**

Circle the fraction that represents the whole set of balls.



[✓ $\frac{7}{7}$]	$\frac{1}{7}$	$\frac{7}{8}$	$\frac{7}{7}$	$\frac{4}{7}$

872) $\frac{1}{2}$ is called

[✓ one-half]	one-hunk	one-hulk	one-half

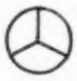
873) $\frac{3}{3}$ is called a ______

	Write the word.
fraction	

874) Write the fraction called one-half.

$\frac{1}{2}$	

875) Write the fraction that represents the whole circle.



$\frac{3}{3}$	

2076) $\boxed{416}$

There were 7 marbles in a glass. Yo-Yo-Yogi took 4 of the marbles. What fractional part of the marbles did Yogi take?

$\frac{4}{7}$ of the marbles.	

2077)

There were 3 oranges in a box. Crazy Cucumber ate 2 of the oranges. What fractional part of the oranges did Crazy eat?

$\frac{2}{3}$ of the oranges	

2078)

Hypo Von Kondria ate 10 pills from a bottle of pills that had 20 pills in it. Circle the reduced fractional part of the pills that Hypo ate.

[✓ $\frac{1}{2}$]	$\frac{3}{4}$ $\frac{1}{2}$ $\frac{7}{11}$

2079)

Reduce if you can.

$\frac{7}{11} = \frac{7 \times \cancel{1}}{11 \times \cancel{1}} = \frac{7}{11}$ [✓ No]	$\frac{7}{11} =$ Can 7/11 be reduced? Yes No

2080)

How many halves are there in one whole?

[✓ 2]	1 2 3

MATHEMATICS - ARITHMETIC

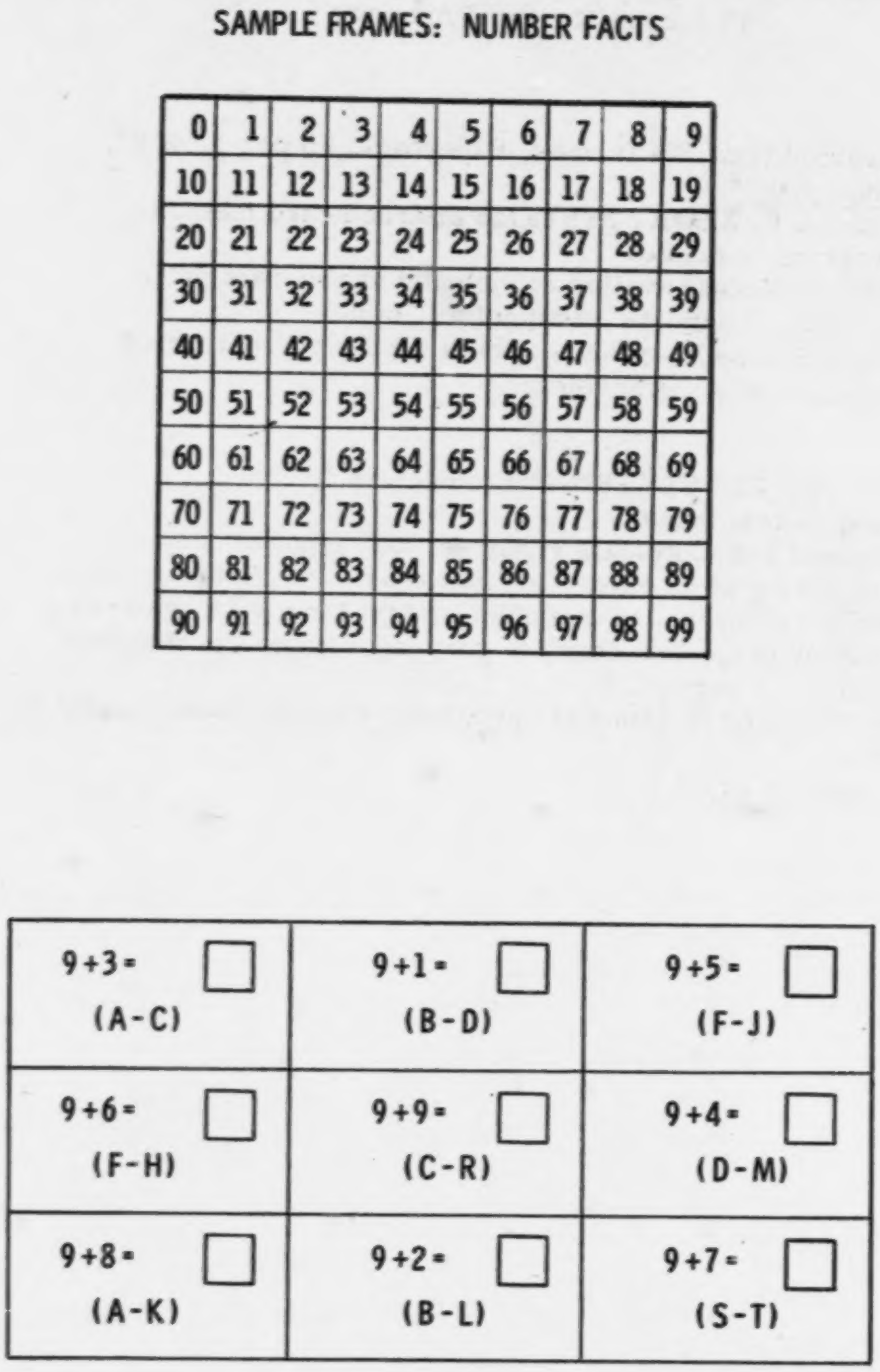
NUMBER FACTS Elementary Grades
EDUCATIONAL DEVELOPMENT
ASSOCIATES, 2302 J. Street, Eureka, Calif.
Published by E-Z SORT SYSTEMS, Ltd.,
45 Second St., San Francisco 5, Calif.

Programed text, 324 frames, Paperback, 75 pp., 5" X 8", "Book price"
For use in E-Z SORT SYSTEMS Instructocard method; program reusable.
Teacher's Manual available; included in program price.
Unit, Final, Diagnostic tests not avaliable.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

INTENDED POPULATION: "Elementary."
Prerequisites: (none)
Equipment and materials required: "A response device consisting of 15 edge-punched cards....printed educational matter published in pamphlet or text form with required student responses coded to correspond with the response device...a sorter..."
Time Required to Complete program: 4 weeks (based partly on data)
(one sample page)

MATHEMATICS - ARITHMETIC

NUMBER FACTS
Educational Development Associates; E-Z SORT SYSTEMS
one sample page:



SAMPLE FRAMES: NUMBER FACTS

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

9+3= ☐ (A-C)	9+1= ☐ (B-D)	9+5= ☐ (F-J)
9+6= ☐ (F-H)	9+9= ☐ (C-R)	9+4= ☐ (D-M)
9+8= ☐ (A-K)	9+2= ☐ (B-L)	9+7= ☐ (S-T)

MATHEMATICS - ARITHMETIC

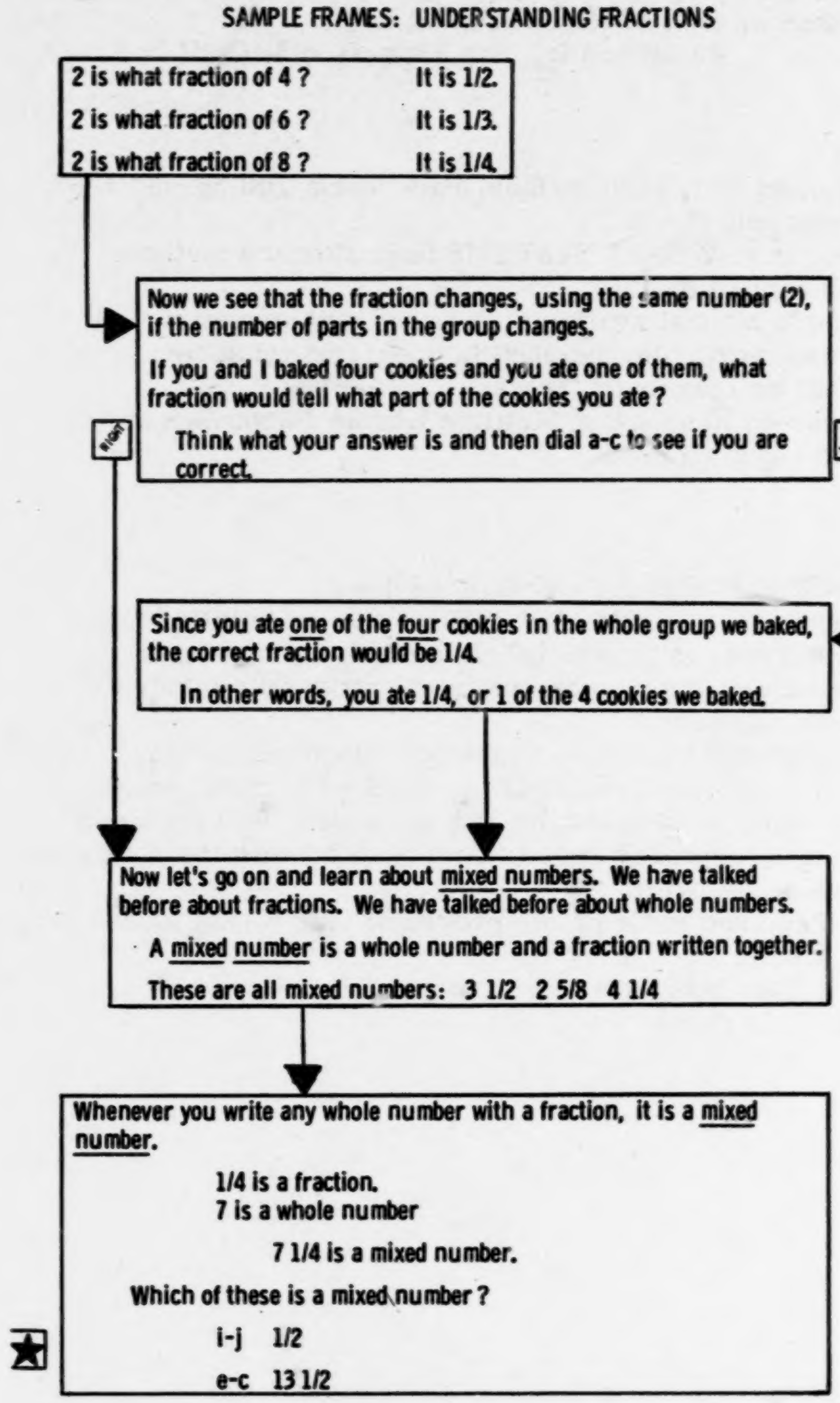
UNDERSTANDING FRACTIONS Grades 4 - 8
EDUCATIONAL DEVELOPMENT ASSOCIATES
2302 J Street, Eureka, Calif.
Published by E-Z SORT SYSTEMS, Ltd.,
45 Second St., San Francisco 5, Calif.

Programed text, 1100 frames, Paperback, 200 pp., 5" X 8",
"Book price"
For use in E-Z SORT SYSTEMS Instructocard method;
program reusable.
Teacher's Manual available; included with program.
Unit tests available: included in program; reusable.
No Final or Diagnostic Tests.
Constructed Responses, Multiple Choice Responses and
Branching all used.

INTENDED POPULATION: Grades 4 - 8.
Prerequisites: "Mastery of addition and subtraction facts.
Mastery of easier multiplication and division facts.
Mastery of simple computational processes involving
whole numbers."
Equipment and Materials required: "Response device consisting of 15 edge-punched cards...printed educational matter published in pamphlet or text book form with required student responses coded to correspond with the response device...a sorter..."
Time Required to Complete program: four weeks (based partly on data.)
Student Data being used for revision.
(one sample page)

MATHEMATICS - ARITHMETIC

UNDERSTANDING FRACTIONS
Educational Development Assoc.; E-Z SORT SYSTEMS
one sample page:



SAMPLE FRAMES: UNDERSTANDING FRACTIONS

2 is what fraction of 4 ?	It is 1/2.
2 is what fraction of 6 ?	It is 1/3.
2 is what fraction of 8 ?	It is 1/4.

Now we see that the fraction changes, using the same number (2), if the number of parts in the group changes.

If you and I baked four cookies and you ate one of them, what fraction would tell what part of the cookies you ate?

Think what your answer is and then dial a-c to see if you are correct.

Since you ate one of the four cookies in the whole group we baked, the correct fraction would be 1/4.

In other words, you ate 1/4, or 1 of the 4 cookies we baked.

Now let's go on and learn about mixed numbers. We have talked before about fractions. We have talked before about whole numbers.

A mixed number is a whole number and a fraction written together.

These are all mixed numbers: 3 1/2 2 5/8 4 1/4

Whenever you write any whole number with a fraction, it is a mixed number.

1/4 is a fraction.
7 is a whole number

7 1/4 is a mixed number.

Which of these is a mixed number?

i-j 1/2
e-c 13 1/2

MATHEMATICS - ARITHMETIC

YOUR PERSONAL TUTOR IN: NUMBER CONCEPTS 1st Grade
INRAD, P.O. Box 4456, Lubbock, Texas

Programed text, 500 frames, Paperback,
$ (?)
No Teacher's Manual available.
Final test available; reusable.
Constructed Responses usually used; some Multiple Choice;
no Branching

INTENDED POPULATION: "1st grade."
Prerequisites:
No Additional Materials required.
Time Required to Complete program: (no data)
Student Data being used for revision.
(one sample page)

MATHEMATICS - ARITHMETIC

YOUR PERSONAL TUTOR IN: NUMBER CONCEPTS
INRAD
one sample page:

EXTRACTS FROM NUMBER CONCEPTS PROGRAM

169. Say "us"

Write "us

us

170. plus

See "us" in plus.

Write plus

plus

171. Plus means "and".

1 and 1 are 2

1 plus 1 is 2

1 plus 1 is ____

2

172. Write the word plus.

MATHEMATICS - ARITHMETIC

YOUR PERSONAL TUTOR IN: FRACTIONS 5th Grade
INRAD, P.O. Box 4456, Lubbock, Texas

Programed text, 900 frames, Paperback,
$ (?)
For use in AVTA machine; reusable.
Teacher's Manual not available.
Final test available; reusable.
Constructed Responses usually used; some Multiple Choice; no Branching

INTENDED POPULATION: "5th Grade."
Prerequisites:
No Additional Materials required.
Time Required to Complete the program: 20 hours (based partly on data.)
Student Data being used for revision.
(one sample page)

MATHEMATICS - ARITHMETIC

YOUR PERSONAL TUTOR IN: FRACTIONS
INRAD
one sample page:

EXTRACTS FROM FRACTION PROGRAM

353. In subtracting like fractions, you subtract the numerators and write the remainder over the denominator. In the fractions 2/3 minus 1/3, the numerators are ____ and ____.

2 1

354. To subtract 1/3 from 2/3, subtact the numerator 1 from the numerator 2, and write the reaminder 1 over the like denominator 3. Write the answer. __________.

1/3

355. In subtracting like fractions only the ______________ are subtracted.

numerators

356. Study this example:

$$\begin{array}{r} \text{5 eighths} \\ \underline{\text{-2 eighths}} \\ \text{3 eighths} \end{array} = \begin{array}{r} 5/8 \\ \underline{-2/8} \\ 3/8 \end{array}$$

The numerator 2 has been subtracted from the numerator _____.

5

MATHEMATICS - ARITHMETIC

YOUR PERSONAL TUTOR IN: SIGNED NUMBERS **8th grade.**
INRAD, P.O. Box 4456, Lubbock, Texas

Programed text, 290 frames, Paperback,
$ (?)
For use in AVTA machine; reusable.
No Teacher's Manual available.
Final tests available; reusable.
Constructed Responses usually used; some Multiple Choice: no Branching.

INTENDED POPULATION: "8th grade."
Prerequisites:
No Additional Materials required.
Time Required to Complete program: 4 hours (based partly on data.)
Student Data being used for revision.
(One sample page)

MATHEMATICS - ARITHMETIC

YOUR PERSONAL TUTOR IN: SIGNED NUMBERS
INRAD
one sample page:

EXTRACTS FROM SIGNED NUMBERS PROGRAM

---

122. To add two numbers having like signs, we add their absolute values and keep the same sign. For example, the sum of (-3) + (-2) = -5. Likewise, the sum of (-10) + (-6) = ________.

-16

123. The sum of (-5) + (-4) is -9. The sum should have a __________ sign, because both numbers that are added together have a ______ sign.

minus
minus

124. The sum of (+4) + (+6) = +10. Also, the sum of (+8) + (+2) = ___________.

+10

125. To add two numbers having like signs, we add the ____________ values of the numbers and keep the _____________ sign.

absolute
same

126. The sum of (+5) + (+6) = ________.

+11

MATHEMATICS - ARITHMETIC

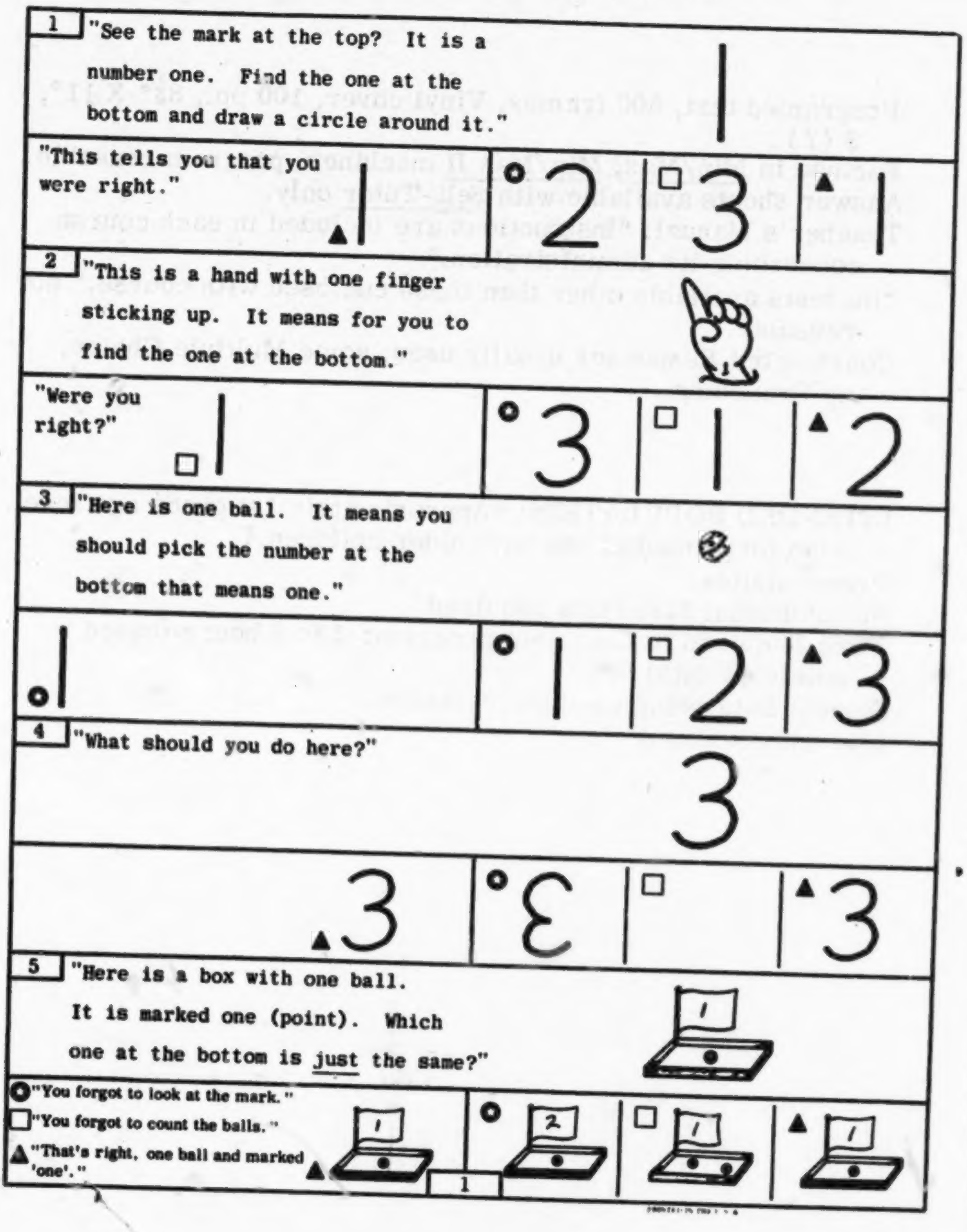
ELEMENTARY ARITHMETIC SERIES: INTRODUCTION TO NUMBERS Primary
IRENE MYERS,
JOHN FULLILOVE, Programers, TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 500 frames, Vinyl cover, 100 pp., $8\frac{1}{2}$" X 11", $ (?).
For use in Min/Max, Min/Max II machines; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
"No tests available other than those enclosed with course," not reusable.
Constructed Responses usually used; some Multiple Choice, no Branching.

INTENDED POPULATION: "Approximately 1st grade age level. Also for remedial use with older children."
Prerequisites:
No Additional Materials required.
Time Required to Complete program: 3 to 6 hours (based solely on data).
Student Data being used for revision.
(one sample page)

MATHEMATICS - ARITHMETIC

ELEMENTARY ARITHMETIC SERIES:
INTRODUCTION TO NUMBERS
Myers, Fullilove; TMI-GROLIER
one sample page:



1 "See the mark at the top? It is a number one. Find the one at the bottom and draw a circle around it."

"This tells you that you were right."

2 "This is a hand with one finger sticking up. It means for you to find the one at the bottom."

"Were you right?"

3 "Here is one ball. It means you should pick the number at the bottom that means one."

4 "What should you do here?"

5 "Here is a box with one ball. It is marked one (point). Which one at the bottom is just the same?"

○ "You forgot to look at the mark."

☐ "You forgot to count the balls."

▲ "That's right, one ball and marked 'one'."

MATHEMATICS - ARITHMETIC

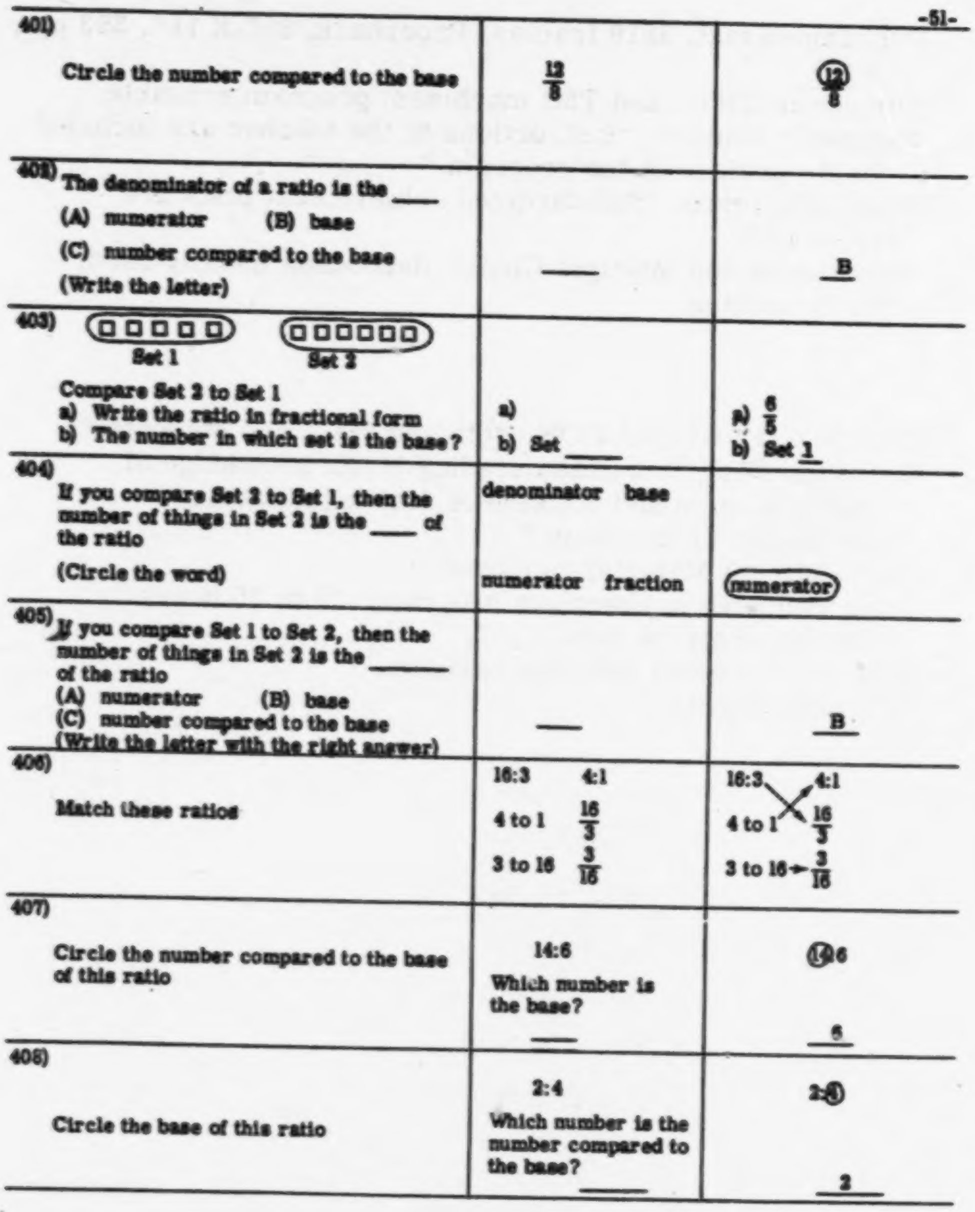
RATIOS, PROPORTIONS, & PERCENTAGES Elementary +
EDWARD J. RICKERT, GPTC, consulting with
DR. MERLE MITCHELL
Published by GENERAL PROGRAMMED TEACHING
CORPORATION,
1719 Girard NE, Albuquerque, New Mexico

Programed text, 2819 frames, Paperback, 8½" X 11", 353 pp., $ (?) .
For use in GPTC and TMI machines; program reusable.
Teacher's Manual: "Instructions to the teacher are included in the preface of the program."
Diagnostic tests: "Standardized achievement tests are available."
Constructed and Multiple Choice Responses usually used; no Branching.

INTENDED POPULATION: "6th and 7th grade students."
Prerequisites: "5th grade reading level; knowledge of multiplication and division of decimal numbers; knowledge of fractions."
No Additional Material required.
Time Required to Complete program: 20 to 25 hours (based solely on data.)
Student Data being used for revision.
(3 sample pages)

MATHEMATICS - ARITHMETIC

RATIOS, PROPORTIONS, & PERCENTAGES
Rickert, Mitchell; GENERAL PROGRAMMED TEACHING CORPORATION
3 sample pages:



-51-

401) Circle the number compared to the base	$\frac{12}{8}$	$\frac{12}{8}$
402) The denominator of a ratio is the ___ (A) numerator (B) base (C) number compared to the base (Write the letter)	___	B
403) ☐☐☐☐☐ Set 1 ☐☐☐☐☐☐ Set 2 Compare Set 2 to Set 1 a) Write the ratio in fractional form b) The number in which set is the base?	a) b) Set ___	a) $\frac{6}{5}$ b) Set 1
404) If you compare Set 2 to Set 1, then the number of things in Set 2 is the ___ of the ratio (Circle the word)	denominator base numerator fraction	numerator
405) If you compare Set 1 to Set 2, then the number of things in Set 2 is the ___ of the ratio (A) numerator (B) base (C) number compared to the base (Write the letter with the right answer)	___	B
406) Match these ratios	16:3 4:1 4 to 1 $\frac{16}{3}$ 3 to 16 $\frac{3}{16}$	16:3 4:1 4 to 1 $\frac{16}{3}$ 3 to 16 → $\frac{3}{16}$
407) Circle the number compared to the base of this ratio	14:6 Which number is the base? ___	14:6 6
408) Circle the base of this ratio	2:4 Which number is the number compared to the base? ___	2:4 2

409) Circle the numerator of this ratio	$\frac{12}{3}$ Is the numerator the base? Yes No	$\frac{\boxed{12}}{3}$ [✓ No]
410) Circle the number compared to the base of this ratio	$\frac{16}{32}$ Which number is the base? ____	$\frac{\boxed{16}}{32}$ 32
411) Which number is the one compared to the base? Circle it.	$\frac{1}{10}$ Is the numerator the number compared to the base? Yes No	$\frac{\boxed{1}}{10}$ [✓ Yes]
412) What number is the base of the ratio 28:14? Write the number	____	14
413) In the ratio 19 to 6, the number compared to the base is 19 (Circle)	Yes No	[✓ Yes]
414) In the ratio 3 to 7, 3 is the base (Circle)	True False	[✓ False]
415) (△ △) Set 1 (△ △ △ △ △ △) Set 2 Write the ratio to compare Set 1 to Set 2 (Use the word to)	Is Set 1 the base? Yes No	2 to 6 [✓ No]
416) (□ □ □) Set 1 (□□□□□□□□□□) Set 2 Write the ratio in fractional form to compare Set 2 to Set 1	Is Set 2 the number compared to the base? Yes No	$\frac{10}{3}$ [✓ Yes]

1097) (△△△) Set 1 (△△△△△△) Set 2 a) Compare Set 2 to Set 1 as a fraction. b) Make a true proportion by reducing the fraction to lowest terms.	a) $\frac{(\ )}{(\ )}$ b) $\frac{(\ )}{(\ )} = \frac{(\ )}{(\ )}$	a) $\frac{(6)}{(3)}$ b) $\frac{(6)}{(3)} = \frac{(2)}{(1)}$
1098) Circle the terms of the proportion	$\frac{12}{3} = \frac{36}{9}$	$\frac{12}{3} = \frac{36}{9}$
1099) A proportion has _____ terms. (Circle)	two four	[✓ four]
1100) A proportion is made up of 2 ____ that are equal. (A) bases (B) rates (C) ratios (Fill in the letter)	____	C
1101) To check that $\frac{40}{2} = 20$, multiply the quotient times the ____ to equal the number compared to the base. (Circle the answer)	product base rate sum	[✓ base]
1102) The proportion 3 to 8 = 12 to 32 can be written as $\frac{3}{8} = \frac{12}{32}$. Write the proportion 7 to 6 = 21 to 18 using fractions on each side of an equals sign		$\frac{7}{6} = \frac{21}{18}$
1103) Circle the true proportion	$\frac{3}{2} = \frac{6}{4}$ $\frac{3}{1} = \frac{6}{5}$	[✓ $\frac{3}{2} = \frac{6}{4}$]
1104) a) Circle the terms of the proportion. b) Is the proportion true?	a) $\frac{15}{3} = \frac{5}{1}$ b) Yes No	a) $\frac{15}{3} = \frac{5}{1}$ b) [✓ Yes]

MATHEMATICS - ARITHMETIC

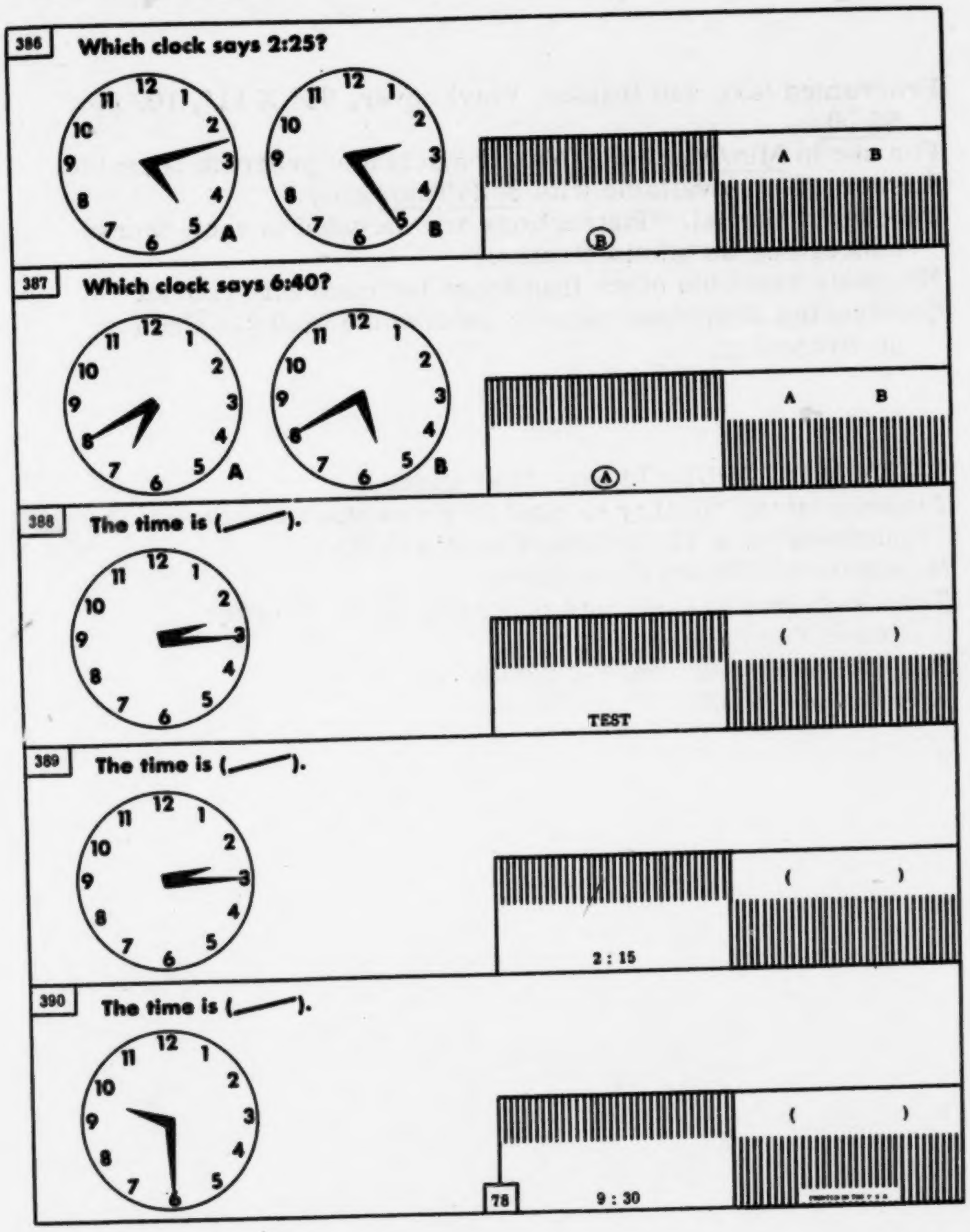
ELEMENTARY ARITHMETIC SERIES: Primary Grades
TIME TELLING
DONALD T. TOSTI,
POLO C. de BACA, Programers; TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 440 frames, Vinyl cover, $8\frac{1}{2}$" X 11", 100 pp., $5.00.
For use in Min/Max, Min/Max II machines; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
"No tests available other than those included with course."
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "2nd grade."
Prerequisites: "Ability to read 26 elementary words, recognize numbers up to 12, and count by 5's to 60."
No Additional Material required.
Time Required to Complete program: $1\frac{1}{2}$ to $3\frac{1}{2}$ hours (based solely on data.)
Student Data being used for revision.
(one sample page)

MATHEMATICS - ARITHMETIC

ELEMENTARY ARITHMETIC SERIES:
TIME TELLING
Tosti, de Baca; TMI-GROLIER
one sample page:



386 Which clock says 2:25?

A B

Ⓑ

387 Which clock says 6:40?

A B

Ⓐ

388 The time is (____).

( )

TEST

389 The time is (____).

( )

2 : 15

390 The time is (____).

( )

78

9 : 30

12
1
2
3
4
5
6
7
8
9
10
11
A
B

MATHEMATICS - ARITHMETIC

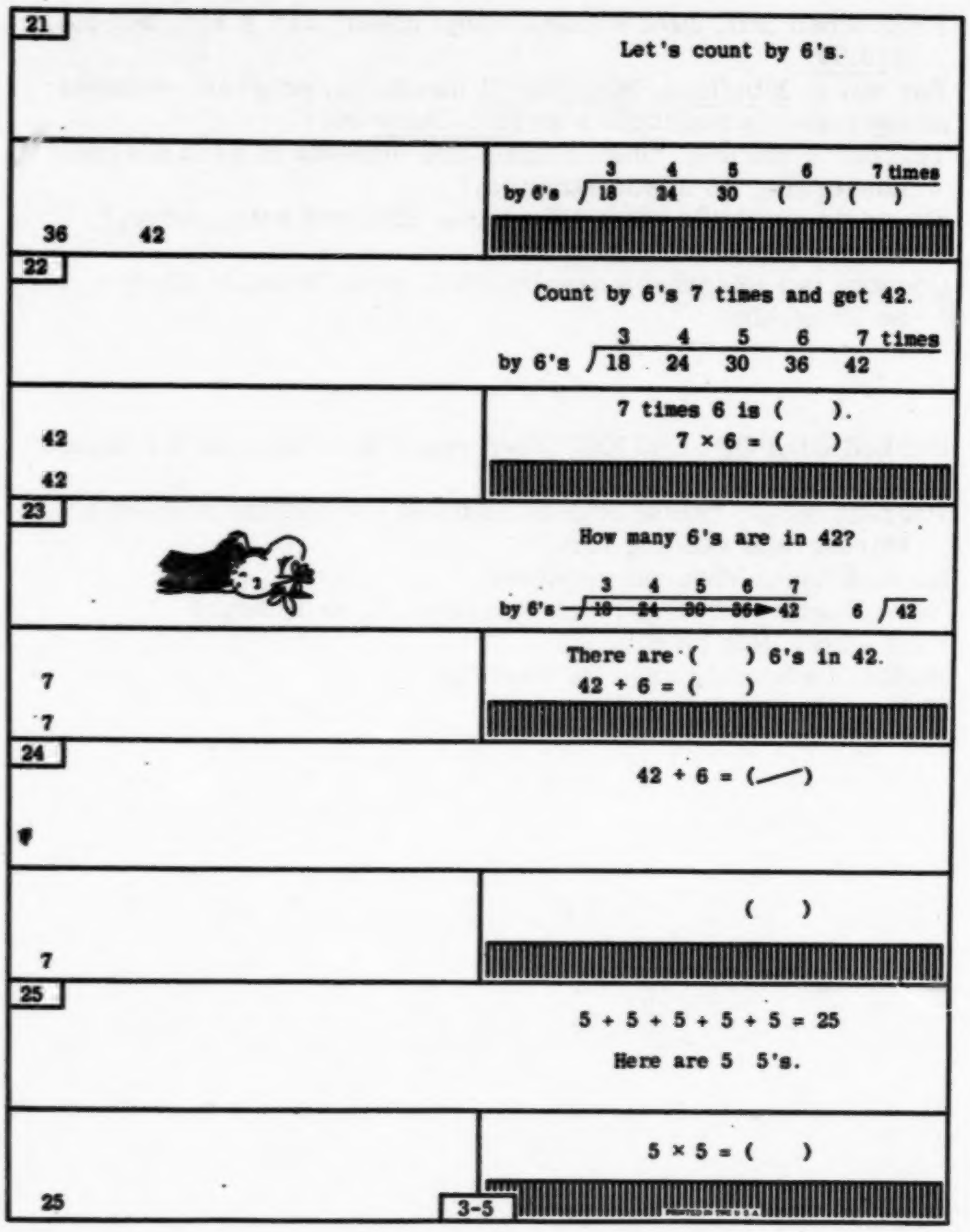
ELEMENTARY ARITHMETIC SERIES: 3rd Grade +
MULTIPLICATION & DIVISION FACTS
DONALD T. TOSTI, Programer; TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 2076 frames, Vinyl cover, 8½" X 11", 346 pp., $10.00.
For use in Min/Max, Min/Max II machines; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
"No tests available other than those enclosed with course," not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "3rd grade and remedial for higher grades."
Prerequisites: "Knowledge of addition and subtraction and a third-grade reading level."
No Additional Material required.
Time Required to Complete program: 25 to 30 hours (based solely on data.)
Student Data being used for revision.
(2 sample pages)

MATHEMATICS - ARITHMETIC

**ELEMENTARY ARITHMETIC SERIES:
MULTIPLICATION & DIVISION FACTS
Tosti; TMI-GROLIER
2 sample pages:**



21

Let's count by 6's.

3 4 5 6 7 times
by 6's) 18 24 30 ( ) ( )

36 42

22

Count by 6's 7 times and get 42.

3 4 5 6 7 times
by 6's) 18 24 30 36 42

7 times 6 is ( ).
7 × 6 = ( )

42

42

23

How many 6's are in 42?

3 4 5 6 7
by 6's) ~~18 24 30 36~~ → 42 6) 42

There are ( ) 6's in 42.
42 ÷ 6 = ( )

7

7

24

42 ÷ 6 = ( )

( )

7

25

5 + 5 + 5 + 5 + 5 = 25

Here are 5 5's.

5 × 5 = ( )

25

3-5

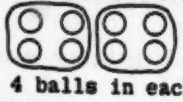
61

3 multiplied by 2 = (___)

6

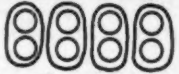
62

2 equal groups



There are 4 balls in each group.

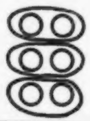
4 equal groups



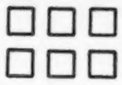
There are (___) balls in each group.

2

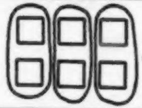
63



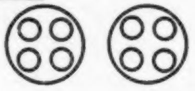
6 balls can be **DIVIDED** into 3 equal groups.



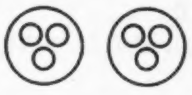
Copy and **DIVIDE** these into 3 equal groups.



64



8 balls have been divided into 2 equal groups. There are 4 balls in each group.

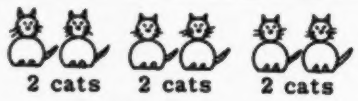


6 balls have been divided into (___) equal groups. How many balls in each group? (___)

2

3

65



2 cats 2 cats 2 cats

6 cats divided into 2's give (___) equal groups of cats.

3

1-13

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MATHEMATICS - ARITHMETIC

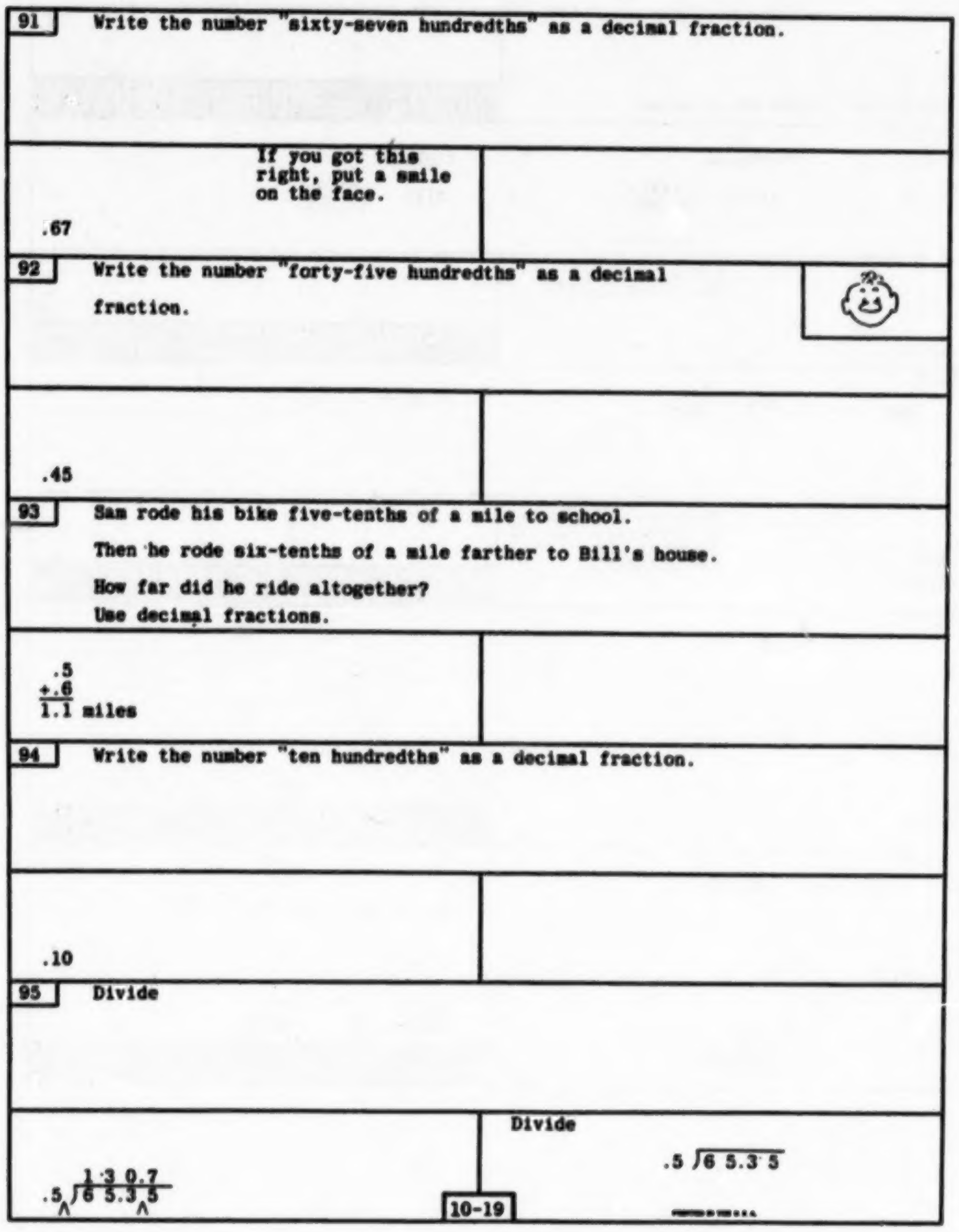
ELEMENTARY ARITHMETIC SERIES: DECIMAL NUMBERS 4th Grade +
DONALD T. TOSTI,
POLO C. de BACA, Programers; TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 2700 frames, Vinyl cover, $8\frac{1}{2}$" X 11", 553 pp., $12.50.
For use in Min/Max, Min/Max II machines; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
"No tests available other than those enclosed with course," not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "4th grade up."
Prerequisites: "4th grade reading level."
No Additional Material required.
Time Required to Complete program: 15 to 20 hours (based solely on data.)
Student Data being used for revision.
(2 sample pages)

MATHEMATICS - ARITHMETIC

ELEMENTARY ARITHMETIC SERIES:
DECIMAL NUMBERS
Tosti, de Baca; TMI-GROLIER
2 sample pages:



91 Write the number "sixty-seven hundredths" as a decimal fraction.

.67

If you got this right, put a smile on the face.

92 Write the number "forty-five hundredths" as a decimal fraction.

.45

93 Sam rode his bike five-tenths of a mile to school.
Then he rode six-tenths of a mile farther to Bill's house.
How far did he ride altogether?
Use decimal fractions.

$$\begin{array}{r} .5 \\ +.6 \\ \hline 1.1 \end{array}$$ miles

94 Write the number "ten hundredths" as a decimal fraction.

.10

95 Divide

$$\begin{array}{r} 1\,3\,0.7 \\ .5_\wedge\overline{)6\,5.3_\wedge5} \end{array}$$

Divide

$.5\overline{)6\,5.3\,5}$

10-19

106

6 places

$.000618 = \frac{618}{1000000}$

6 zeros

5 places

$.41234 = \frac{41234}{(\quad)}$

( )

100000 See, there are 5 zeros.

107

5 places

$.14379 = \frac{14379}{100000}$

5 zeros

4 places

$.3179 = \frac{3179}{(\quad)}$

How many zeros are here? ( )

( )

10000

108

$.214 = \frac{214}{1000}$

$.3161 = \frac{(\quad)}{(\quad)}$

( )

There were 4 places, so there are ( ) zeros in the denominator.

( )

$\frac{3161}{10000}$

109

.22

( )

Circle one.

$\frac{22}{10}$ $\frac{22}{100}$ $\frac{22}{10000}$

TEST

110

.93612

Circle the right fraction.

$\frac{93612}{1000}$ $\frac{93612}{100000}$

$\frac{93612}{100000}$

1-22

MATHEMATICS - ARITHMETIC

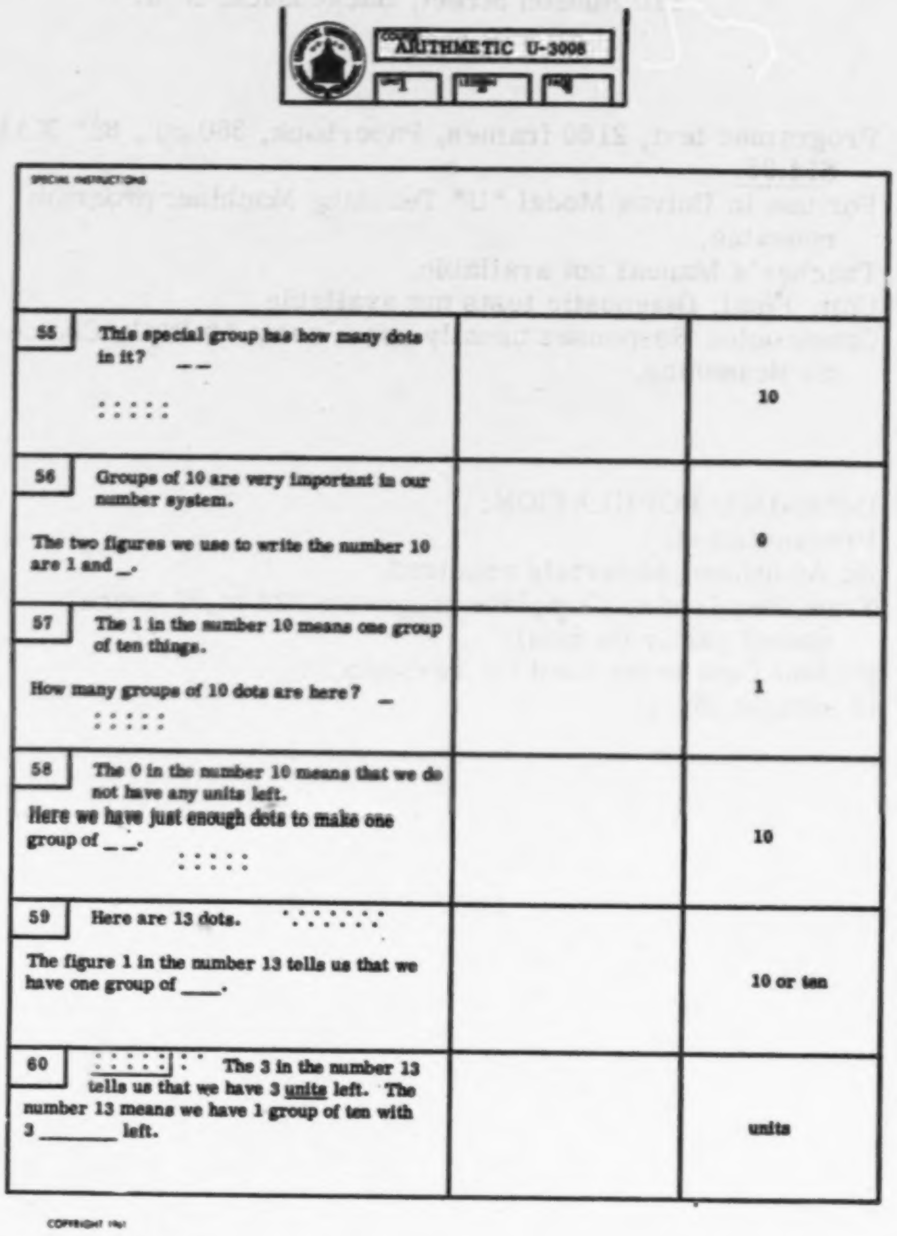
ARITHMETIC U-3008
UNIVOX INSTITUTE INC.
Published by UNIVERSAL ELECTRONICS
LABORATORIES CORPORATION,
510 Hudson Street, Hackensack, N. J.

Programed text, 2160 frames, Paperback, 360 pp., $8\frac{1}{2}$" X 11", $14.95.
For use in Univox Model "U" Teaching Machine; program reusable.
Teacher's Manual not available.
Unit, Final, Diagnostic tests not available.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION:
Prerequisites:
No Additional Materials required.
Time Required to Complete program: "28 to 32 hours" (based partly on data).
Student Data being used for revision.
(2 sample pages)

MATHEMATICS - ARITHMETIC

ARITHMETIC U-3008
Univox Institute Inc.; UNIVERSAL ELECTRONICS LABORATORIES
2 sample pages:



COURSE ARITHMETIC U-3008

SPECIAL INSTRUCTIONS

55 This special group has how many dots in it? __ __ : : : : :		10
56 Groups of 10 are very important in our number system. The two figures we use to write the number 10 are 1 and _.		0
57 The 1 in the number 10 means one group of ten things. How many groups of 10 dots are here? _ : : : : :		1
58 The 0 in the number 10 means that we do not have any units left. Here we have just enough dots to make one group of _ _. : : : : :		10
59 Here are 13 dots. The figure 1 in the number 13 tells us that we have one group of ____.		10 or ten
60 The 3 in the number 13 tells us that we have 3 units left. The number 13 means we have 1 group of ten with 3 ________ left.		units

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COURSE ARITHMETIC U-3008

UNIT 1 | LESSON 4 | PAGE 3

SPECIAL INSTRUCTIONS

121 53 is a number that has 2 places in it. There is a 5 in one place and a ________ in the other place.		3
122 The 5 in the number 53 is in the ________ place.		tens'
123 The 3 in the number 53 is in the ________ place.		units'
124 In the number 47, the 7 is in the units' place. It tells how many ________ are left.		units
125 The 4 in 47 tells how many groups of ten there are. The 4 is in the ________ place.		tens'
126 47 is a two-place number. One place is called the tens' place and tells how many groups of ________ there are.		ten

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MATHEMATICS - GEOMETRY

APPLIED GEOMETRY 36
R. CLAYTON COURSEY, Education Engineering, Inc.
Published by EDUCATION ENGINEERING, Inc.,
3810 Pacific Coast Highway, Torrance, Calif.

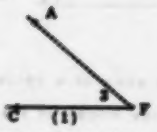
8640 frames; for use in "SPEED" machine, $80; program reusable.
Programed text, Paperback, 288 pages, 5" X 7",
8 separate units @ $3.75 each.
Teacher's Manual available @ $4.00.
Unit, Final, Diagnostic tests available at $3.75 each; tests reusable
Multiple Choice Responses always used; no Constructed Responses; no Branching.

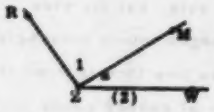
INTENDED POPULATION:
Prerequisites: Arithmetic.
Additional Equipment required: "SPEED" teaching machine, $700 & $800.
Time Required to Complete program: 20 hours (based partly on data)
Student Data being used for revision.
(two sample pages)

MATHEMATICS - GEOMETRY

APPLIED GEOMETRY 36
Coursey; EDUCATION ENGINEERING
two sample pages:

HOW TO NAME AN ANGLE





The common ways to name an angle are:

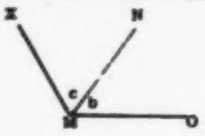
1. Place a number between the sides.
2. Place a lower-case letter between the sides.
3. Use the name of the vertex if only one angle has that vertex.
4. Use three capital letters. Be sure to put the vertex letter in the middle.

In figure (1), ∠3 can be named ∠AFC, ∠CFA or simply ∠F. Since Z in figure (2) is the vertex of more than one angle, none of the angles can be named ∠Z. Another name for ∠a is ∠WZM; ∠1 is also ∠MZR; and another name for (∠1 + ∠a) is ∠WZR.

3601 - S12

The common ways to name an angle are:

1. Place a ________ between the sides.
2. Use the name of the ________ if only one angle has that ________.
3. Use __________ capital letters.
4. Place a ________ letter between the sides.
5. Another name for angle b in the following figure is ________.

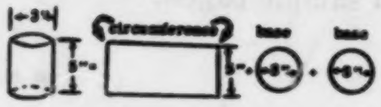


1. NMO
2. vertex, vertex
3. lower case
4. side, side
5. two
6. three
7. upper case
8. MNO
9. number
10. one

3601-Q12

SURFACE AREA OF A CYLINDER

The surface area of a prism can be found by adding the area of the bases and the area of the sides. The cylinder follows the same rule, but its side must be first changed into a rectangle. You can easily see how this is done if you take any item of canned goods and cut off the label along a line perpendicular to the base. When you spread out the label you will have a rectangle. The length of the rectangle will equal the circumference of the circle. The length times the height w'll equal the area.



The surface area of a cylinder equals the sum of the areas of the side and the bases.

3605-S16

1. The surface area of a cylinder can be found by adding the area of the bases and the area of the ______.
2. If the side of a cylinder is spread out it will form a _______.
3. The length of the figure in question 2 will be equal to the ______ of the circles which are the bases of the cylinder.
4. The width of the figure in question 2 will be the ____ of the cylinder.
5. The formula for the circumference of a circle is ______.

1. square
2. bases
3. area
4. rectangle
5. 1256
6. height
7. circumference
8. 37.7
9. sides
10. $C = 2\pi r$

3605 - Q16

MATHEMATICS - GEOMETRY

PLANE GEOMETRY Jr. H.S.

EDWARD B. CURTIS, Teaching Fellow at
Harvard University
Published by ENCYCLOPAEDIA BRITANNICA FILMS, Inc.
1150 Wilmette Ave., Wilmette, Ill.

Programed text, 11,207 frames, Paperback, 1,151 pp., 8½" X 11", $19.75.
For use in KONCEPT-O-GRAPH machine; program reusable.
Answer sheets available.
Teacher's Manual available, included with program.
Diagnostic tests available @ $1.50 per package of 30; not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: 9th grade.
Prerequisites: Algebra 1.
Additional Equipment or Material required: Student Supplement, essential to course and included in price above.
Time Required to Complete program: 185 classroom hours (based partly on data).
Student Data being used for revision.
(10 sample pages)

MATHEMATICS - GEOMETRY

PLANE GEOMETRY
Curtis; ENCYCLOPAEDIA BRITANNICA FILMS
10 sample pages:

701. Look at the proposition in figure 102. *AB* and *CD* are two lines meeting at point *M*. We are given that *M* is the ______ (wd.) of line segment *AB*.	midpoint
702. We are also given that ______ (sign and lets.).	$\angle A = \angle B$
703. We are asked to prove that ______ (equation).	$AC = BD$
704. It is a good idea to mark on the figure with little lines to indicate information given. Since *M* is the midpoint of line segment *AB*, we know that *AM* equals ______ (lets.).	*MB* (in either order)
705. Mark *AM* and *MB* each with a little line to remind us that they are ______ (wd.).	equal
706. We also mark $\angle A$ and ______ (sign and let.) with little arcs to remind us that they, too, are equal.	$\angle B$
707. We could show that *AC* and *BD* are equal if we knew that they were corresponding parts of ______ (wd.) triangles.	congruent
708. We might be able to show that *AC* and *BD* are corresponding parts of the congruent triangles $\triangle AMC$ and ______ (sign and lets.).	$\triangle BMD$
709. How can we show that $\triangle AMC$ is congruent to $\triangle DMB$? We know that $\angle A =$ ______ (sign and let.) and that $AM =$ ______ (lets.).	$\angle B$, *BM* (in either order)
710. The ASA Theorem would tell us that the two triangles were congruent if we knew that $\angle CMA =$ ______ (sign and lets.).	$\angle DMB$
711. But we know that $\angle CMA = \angle BMD$ by the theorem, "When two straight lines intersect, the ______ ______ (wds.) are equal."	vertical angles

712. By the ASA Theorem, $\triangle CMA$ is congruent to $\triangle DMB$. Now we see that $AC=BD$, since they are ______ ______ (wds.) of congruent triangles.	corresponding parts (or corresponding sides)
713. Now let us give a formal proof of the theorem. Statement 1 will be "______ (words and equation)," which is the information given.	M is the midpoint of AB, $\angle A=\angle B$
714. Write in the correct statement 1 and reason 1 on figure 103. Statement 2 will be $AM=$______ (lets.).	MB
715. Write in the correct statement 2. Reason 2 will be the definition, "The midpoint divides a line segment into two ______ (wd.) parts.	equal
716. Write in the correct reason 2. Statement 3 will be $\angle CMA=$______ (sign and lets.).	$\angle DMB$ (or $\angle BMD$)
717. Write in the correct statement 3. Reason 3 is our first theorem, "When two straight lines intersect ______ (wds.)."	the vertical angles formed are equal
718. Write in the correct reason 3. Statement 4 will be $\triangle AMC\cong$______ (sign and lets.). (order important)	$\triangle BMD$
719. Write in the correct statement 4. Reason 4 is, "______ (3 lets.)."	ASA
720. Write in the correct reason 4. Statement 5 is $AC=$______.	BD
721. Write in statement 5. Reason 5 is "______ parts of congruent triangles are equal." Also write Q.E.D. meaning that the proof is finished.	corresponding
722. We have now completed the proof of the proposition. Does your complete proof of the proposition resemble that of figure 104? Answer yes or no.	(If "no," correct it.)

723. So far in this plane geometry course, we have proven three theorems. The first one is called the "Vertical Angle Theorem." It reads: "When two straight lines intersect, ________ ________ (wds.)."	the vertical angles formed are equal
724. The second theorem which we have proved is the SAS Theorem. It reads: "If ________ ________ (wds.) of one triangle are equal to ________ ________ (same wds.) of a second triangle, then the triangles are ________ (wd.)."	two sides and the included angle, two sides and the included angle, congruent
725. Our third theorem is called the ASA Theorem. It reads: "If ________ (wds.) of one triangle are equal to ________ (same wds.) of another triangle then the two triangles are ________ (wd.)."	two angles and the included side, two angles and the included side, congruent
726. We say that two triangles are congruent if they can be made to ________ (wd.).	coincide
727. If two triangles are congruent, that is, if they can be made to coincide, then they have the same ______ and ______ (wds.).	size, shape
728. Once we know that two triangles are congruent, then we know that each pair of ________ (wd.) parts are equal.	corresponding
729. We call the Vertical Angle Theorem, the SAS Theorem, and the ASA Theorem "theorems" because they are general statements which we have proven true, and they are frequently useful in proving other statements. A theorem may be used as a ________ (wd.) why a statement is true.	reason
730. The proposition in figure 105 shows another use of the ASA Theorem. Look at the figure. We are given a quadrilateral ______ (lets.).	*ABCD*
731. In figure 105 we are given quadrilateral *ABCD* with $\angle BAD$ and $\angle BCD$ both bisected by line ______.	*AC*

732. The bisector of an angle divides that angle into two ______ (wd.) parts.	equal
733. Since AC bisects $\angle BAD$, we know that $\angle BAC$ and ______ (sign and lets.) are equal.	$\angle DAC$ (or $\angle CAD$)
734. Mark $\angle BAC$ and $\angle DAC$ each with a little arc to remind us that they are ______ (wd.).	equal
735. Since AC bisects $\angle BCD$, we know that $\angle BCA =$ ______ (sign and lets.).	$\angle DCA$
736. Mark $\angle BCA$ and ______ (sign and lets.) with a small double arc to remind us that they are equal.	$\angle DCA$ (or $\angle ACD$)
737. We are asked to prove that ______ (equation).	$\angle B = \angle D$
738. We could prove that $\angle B = \angle D$ if we knew that they were ______ ______ (wds.) of congruent triangles.	corresponding parts (or corresponding angles)
739. We can use the ASA Theorem to show that $\triangle BAC$ and ______ (sign and lets.) are congruent.	$\triangle DAC$
740. To apply the ASA Theorem, we use the fact that $\angle BAC = \angle DAC$ $AC =$ ______ $\angle BCA =$ ______.	AC, $\angle DCA$
741. Now that we know that the two triangles are congruent by the ASA Theorem, then we know that $\angle B =$ ______ (sign and let.), since they are corresponding parts of the congruent triangles.	$\angle D$
742. Now let us give a formal proof of the proposition. The first statement contains the information given. That is, we write down statement 1 as "Given ______ (three statements)."	quadrilateral $ABCD$, $\angle BAD$ is bisected by AC, $\angle BCD$ is bisected by AC

743. Write in the correct statement 1 and reason 1. Next, we make the statement that the angles marked with a single arc are equal. Statement 2 is "________ $= \angle DAC$."	$\angle BAC$
744. Write in the proper statement 2. Reason 2 reads, "Definition: "The ____________ (wd.) of an angle divides the angle into two equal parts."	bisector
745. Statement 3 will be to the effect that a side of the upper triangle equals a side of the lower triangle. The triangles have a side in common which is the line segment ________ (lets.).	AC
746. Statement 3 will read "$AC=AC$." Reason 3 will be the word "____________ (wd.)."	Identity
747. Write in the correct statement 3 and reason 3. Statement 4 expresses the fact that the angles marked with double arcs are equal. That is, "________ $= \angle DCA$."	$\angle BCA$
748. Reason 4 is, "Definition: ____."	The bisector of an angle divides the angle into two equal parts (or words with equivalent meaning)
749. Write in the correct reason 4. Statement 5 will be, "________ $\cong \triangle DAC$." Reason 5 will be "ASA."	$\triangle BAC$
750. Write in the correct statement 5 and reason 5. Statement 6 is, "__________," the statement we were asked to prove.	$\angle B = \angle D$
751. Write in the correct statement 6. Reason 6 is "____ (wds.)."	Corresponding parts (or angles) of congruent triangles are equal
752. In the proposition which we have just finished, we have used the ______ Theorem to show that the upper and lower triangles are congruent.	ASA

753. Write the letters "Q.E.D.," meaning that we have finished the proof. Does your completed proof resemble that of figure 106?	
754. Look at the proposition in figure 107. We are given AB and CD, two straight lines intersecting at X. We are also given ______ $=DX$ and ______ $=\angle D$.	AX, $\angle A$
755. We are asked to ______ that $AC=DB$.	prove
756. We are given that $AX=DX$. Mark these each with a little line to remind us that they are ______.	equal
757. We should also mark $\angle A$ and $\angle$ ______ (let.) each with a little arc to remind us that they are equal.	D
758. We would know that $AC=DB$ if we knew that $\triangle AXC$ and $\triangle$ ______ were congruent.	DXB
759. How can we show that the triangles are congruent? We could use the ______ Theorem if we knew that $\angle AXC=\angle DXB$.	ASA
760. We know that $\angle AXC=\angle DXB$ by the ______ angle Theorem.	vertical
761. Now we see that $\triangle AXC \cong \triangle DXB$ with $\angle A$ corresponding to $\angle D$ Side AX corresponding to ______ $\angle AXC$ corresponding to ______.	DX, $\angle DXB$ (or $\angle BXD$)
762. We mark $\angle AXC$ and ______ with double arcs to remind us that they are equal (by the vertical angle theorem).	$\angle DXB$ (or $\angle BXD$)
763. Now we see that AC and DB are ______ ______ of congruent triangles and so are equal.	corresponding parts (or corresponding sides)

764. Now we can give a formal proof of the proposition. Our first statement contains the information given, “____________ ____________, ____________, ____________.”	*AB* and *CD* are two straight lines intersecting at point *X*, $AX=DX$, $\angle A=\angle D$
765. Write in the correct statement 1 and reason 1. Statement 2 will be “$\angle AXC=$________,” which is the second pair of corresponding angles.	$\angle DXB$
766. Write in the correct statement 2. Reason 2 is the theorem, “When two straight lines intersect, ____________ ____________ (wds.).”	the vertical angles formed are equal
767. Write in the correct reason 2. Statement 3 is “____________$\cong\triangle DXB$.”	$\triangle AXC$
768. Write in the correct statement 3. Reason 3 is the ______ Theorem.	ASA
769. Write in the correct reason 3. Statement 4 is, “____________.” The final statement of the proof.	$AC=DB$
770. Write in the correct statement 4. Reason 4 is, “____________ ____________.”	Corresponding parts of congruent triangles are equal
771. Write in the correct reason 4. Now look at your completed proof. Does it resemble that of figure 108?	
772. We have seen the usefulness of the Vertical Angle Theorem, the SAS Theorem, and the ASA Theorem, since they can be used as ____________ in the proof of another theorem or proposition.	reasons
773. Whenever a general statement or proposition seems useful to us, we shall call it a ____________ and then we can use it as a reason in the proofs of other exercises, propositions, or theorems.	theorem

774. The prefix "iso-" means "equal," or "the same." If a triangle has two sides of the same length, we call it isosceles. The figure in 109 shows a triangle with the two sides AC and ______ equal and is called isosceles.	BC
775. We are given that $\triangle ABC$ is isosceles, with $AC=BC$. Mark side AC and BC each with a little line to remind us that they are ______.	equal
776. The third side of an isosceles triangle is called the base. In figure 109, this would be the line segment ______.	AB
777. The angle between the two equal sides of an isosceles triangle is called the vertex angle. In figure 109, the vertex angle of the isosceles triangle ABC would be the angle ______.	ACB (or simply C)
778. Look at the theorem on figure 109. $\triangle ABC$ is an ______ triangle with the vertex angle C.	isosceles
779. The line CX is the bisector of the ______ angle of the isosceles triangle ABC.	vertex
780. The assertion of the theorem is that the bisector of the vertex angle of the isosceles triangle is also the perpendicular bisector of the ______, which is the side AB.	base
781. The assertion is that the line CX is ______ to the side AB and also bisects side AB.	perpendicular
782. If we are to show that CX is the bisector of AB, we must first show that $AX=$______.	XB
783. .You have already marked side AC and BC each with a little line to remind us that they are equal. Mark also $\angle ACX$ and ______ with a little arc to remind us that they are equal.	$\angle BCX$
784. We would know that AX and XB were equal if we knew that they were ______ ______ of congruent triangles.	corresponding parts (or sides)

785. If we knew that $\triangle AXC \cong \triangle BXC$, then we would know that $AX = XB$ and also that $\angle AXC =$ ________.	$\angle BXC$
786. Once we knew that $\angle AXC = \angle BXC$, then we would know that each of them must be a ________ angle, since the sum of both of them is a straight angle, and then each must be one-half of the straight angle.	right
787. Now let us see if we can show that $\triangle AXC \cong \triangle$________.	BXC
788. $\triangle AXC \cong \triangle BXC$ if we know that $AC =$ ______ $\angle ACX =$ ______ and $CX = CX$.	BC, $\angle BCX$
789. Now we see that $\triangle AXC \cong \triangle BXC$ by the ________ Theorem.	SAS
790. Now let us give a formal proof of our theorem. Our first statement contains the information given: "$\triangle ABC$ is an isosceles triangle, with ________, and the line CX bisecting $\angle ACB$.	$AC = BC$
791. Write in the correct statement 1. Reason 1 is the word "________."	Given
792. Write in the correct reason 1. Statement 2 will be, "$\angle ACX =$ ________."	$\angle BCX$
793. Write in the correct statement 2. Reason 2 is the definition: "The bisector of an angle divides it into two ________ parts."	equal
794. Write in the correct reason 2. Statement 3 is the identity, "________."	$CX = CX$
795. Write in the correct statement 3 and reason 3. Statement 4 is, "$\triangle AXC \cong$ ________."	$\triangle BXC$

796. Write in the correct statement 4. Reason 4 is, "______."	SAS
797. Write in the correct reason 4. Statement 5 is, "$AX=$______."	XB
798. Write in the correct statement 5. Reason 5 is, "____."	Corresponding parts of congruent triangles are equal
799. Write in the correct reason 5. Statement 6 is $\angle AXC=$______.	$\angle BXC$
800. Write in the correct statement 6. Reason 6 is, "____."	Corresponding parts (or angles) of congruent triangles are equal
801. Write in the correct reason 6. Statement 7 is, "$\angle AXC+\angle BXC=$ a ________ angle."	straight
802. Write in correct statement 7. Reason 7 is, "The sum of the angles formed on one side of a straight line make a __________ ________."	straight angle
803. Write in the correct reason 7. Statement 8 is, "Twice $\angle AXC$ is a straight angle," and the reason is the word "Substitution." That is, we have substituted a quantity for its equal in the equation of statement ______.	7
804. Write in the correct statement 8 and reason 8. Statement 9 is, "$\angle AXC=$ a ________ angle."	right
805. Write in the correct statement 9. Reason 9 is the definition of a right angle; that is, "A right angle is one-half of a __________ ________."	straight angle
806. Statement 10 will be "AB and CX are ________________."	perpendicular

MATHEMATICS - GEOMETRY

INFORMAL GEOMETRY I AND II Jr. H. S.
(Two of the ten "Understanding Modern Mathematics" series)
ERNEST RANUCCI, Newark State College
ROBERT ROOP, Roop Associates
Published by THE MACMILLAN COMPANY,
60 Fifth Avenue, New York 11, N.Y.

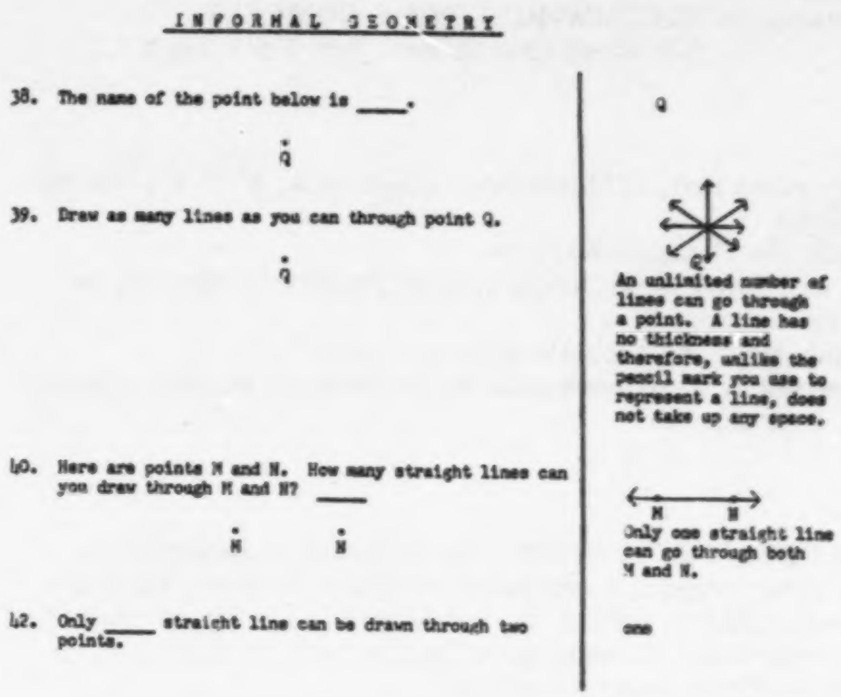
Programed text, 500 frames, Paperback, 96 pp., 8 1/4" X 11", $1.28.
Teacher's Manual: available.
"Final test will be included in Teacher's Manual."
Constructed and Multiple Choice Responses sometimes used; no Branching.

INTENDED POPULATION: "Junior High School mathematics classes."
Prerequisites: "Sixth grade Arithmetic."
Additional Materials required: "A binder which reveals proper responses is available but is not required."
Time Required to Complete program: ten 15-minute periods (based partly on data).
Student Data being used for revision.
(one sample page)

MATHEMATICS - GEOMETRY

INFORMAL GEOMETRY I AND II

Ranucci, Roop; THE MACMILLAN COMPANY
one sample page:



INFORMAL GEOMETRY

38. The name of the point below is ____. Q	Q
39. Draw as many lines as you can through point Q. Q	Q An unlimited number of lines can go through a point. A line has no thickness and therefore, unlike the pencil mark you use to represent a line, does not take up any space.
40. Here are points M and N. How many straight lines can you draw through M and N? ____ M N	M N Only one straight line can go through both M and N.
42. Only ____ straight line can be drawn through two points.	one

MATHEMATICS - SETS

SETS, RELATIONS, AND FUNCTIONS High School - College +
A Programmed Introduction to
Modern Mathematics
MYRA MCFADDEN, mathematics teacher and programmer
Published by McGRAW-HILL BOOK COMPANY,
330 West 42nd Street, New York 36, N.Y.

Programed text, 1150 frames, Paperback, 6" X 9", 300 pp. $3.50.
Teacher's Manual available.
Unit and Final tests "contained in Teacher's Manual, no extra charge."
Diagnostic tests "contained in program."
Constructed Responses usually used; some Mulitple Choice; no Branching

INTENDED POPULATION: "10-12 grade, college level, teacher training, refresher at graduate level, business and technical education, industrial and military training."
Prerequisites: "Knowledge of high school algebra and geometry is recommended."
Additional equipment required: "Ruler and graph paper."
Time Required to Complete program: Average 33 hours, Range 16-52 hrs. (based solely on data.) "Recommend 4-6 weeks use within semester's work."
Student Data used for revisions.
(one sample page)

MATHEMATICS - SETS

SETS, RELATIONS AND FUNCTIONS
A Programmed Introduction to Modern Mathematics
McFadden; McGRAW-HILL
one sample page:

Q1.775

In our discussion on the last frame we indicated two notations

$$f : x \longrightarrow y$$
$$f : x \longrightarrow f(x)$$

Each of these shows that there is a function f which associates with each element x of the domain ________ (complete the statement). The ordered pairs of the first association we write thus (x,y). Furthermore, since y is f(x), we could write the ordered pairs as (x,__).

A1.775

exactly one element y of the range
f(x), the complete notation being (x,f(x))

Q1.776

The collection of all elements x for which the function is defined is called the ________ of the function.
The collection of all elements y (or f(x)) for a given function f is called the _____ of the function.

A1.776

domain, range

Q1.777

f(x) should be read "the value of f at x".
f(m) should be read ________.
f(3) should be read ________.

A1.777

the value of f at m or the value of the function at m
the value of f at 3

Q1.778

$f : x \longrightarrow f(3)$ is read "the function f takes x into the value of the function f at 3.
Now if we have another function which we call "g", we could write $g : x \longrightarrow g(3)$.
How would you read this?

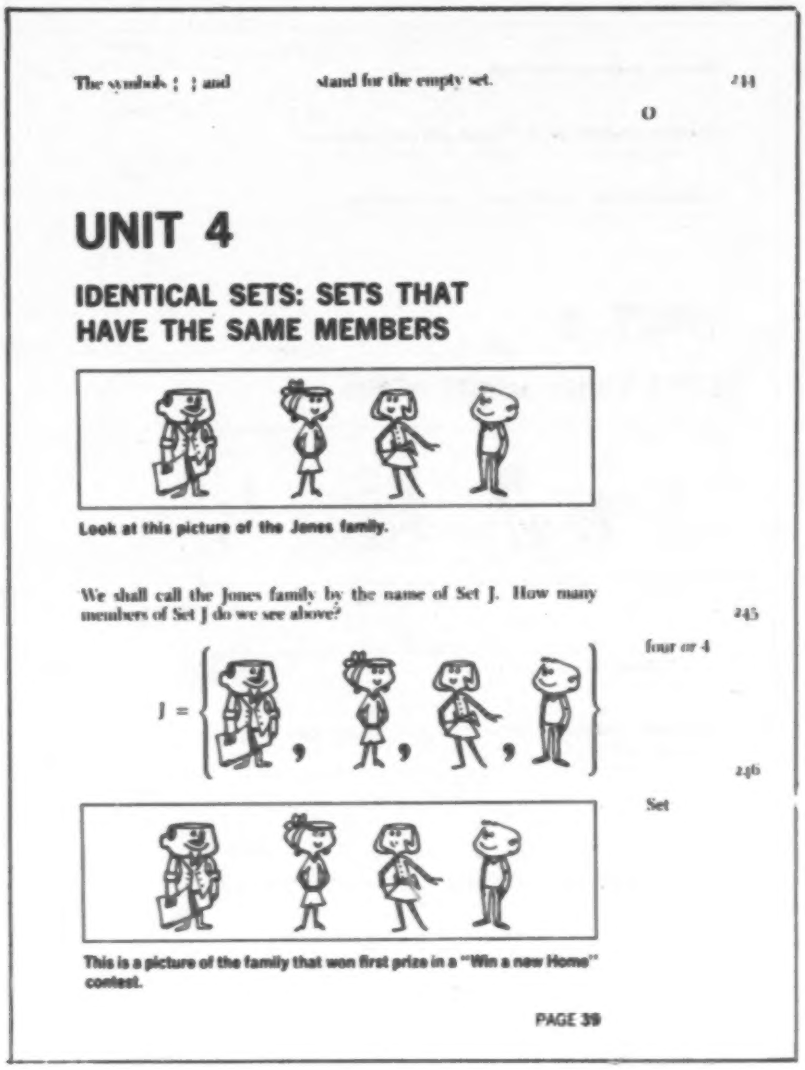
MATHEMATICS ENRICHMENT Elementary
(3 Programs: A, B, C)
Sets, Geometry, Numeration.
GEORGE SPOONER, Central Connecticut State College
Published by HARCOURT, BRACE & WORLD, Inc.,
750 Third Avenue, New York 17, N.Y.

Programed text, approx. 3600 frames,
Hardcover, 6 3/4" X 9 1/8", 580 pp.,
less than $9.00.
Program available in 3 separate units (A, B, C) 192 pp.,
approx. $3.00 each.
Answer sheets (booklets) available, 30¢ (for 1400 answers)
Teacher's Manual available; free to teachers or users of
program.
Unit tests in Teacher's Manual: reusable.
No Final or Diagnostic tests.
Constructed Responses always used; no Multiple Choice;
no Branching.

INTENDED POPULATION: "Chiefly elementary grades 4 - 6;
IQ over 100; Pupils working above grade placement in
arithmetic."
Prerequisites: "Arithmetic to grade 4."
No Additional Material required.
Time Required to Complete program: 12 to 15 hours
each unit (based solely on data)
Student Data being used for revision.
(4 sample pages)

MATHEMATICS - SETS

MATHEMATICS ENRICHMENT
Spooner; HARCOURT, BRACE & WORLD
4 sample pages:



The symbols { } and stand for the empty set. 244

O

UNIT 4

IDENTICAL SETS: SETS THAT HAVE THE SAME MEMBERS

Look at this picture of the Jones family.

We shall call the Jones family by the name of Set J. How many members of Set J do we see above? 245

four or 4

J =

246

Set

This is a picture of the family that won first prize in a "Win a new Home" contest.

PAGE 39

We could never count the points contained _______ a weather balloon.

144

in

Even a grain of sand occupies more _______ than could ever be counted.

145

points

(Review) Space is the set of all _______

146

points

(Review) Another name for the set of all points there are is _______.

147

space

(Review) All exact locations everywhere make up _______

148

space

UNIT 3

LET'S THINK ABOUT PATHS

In the story of Hansel and Gretel, Hansel and Gretel went along a p--- through the woods.

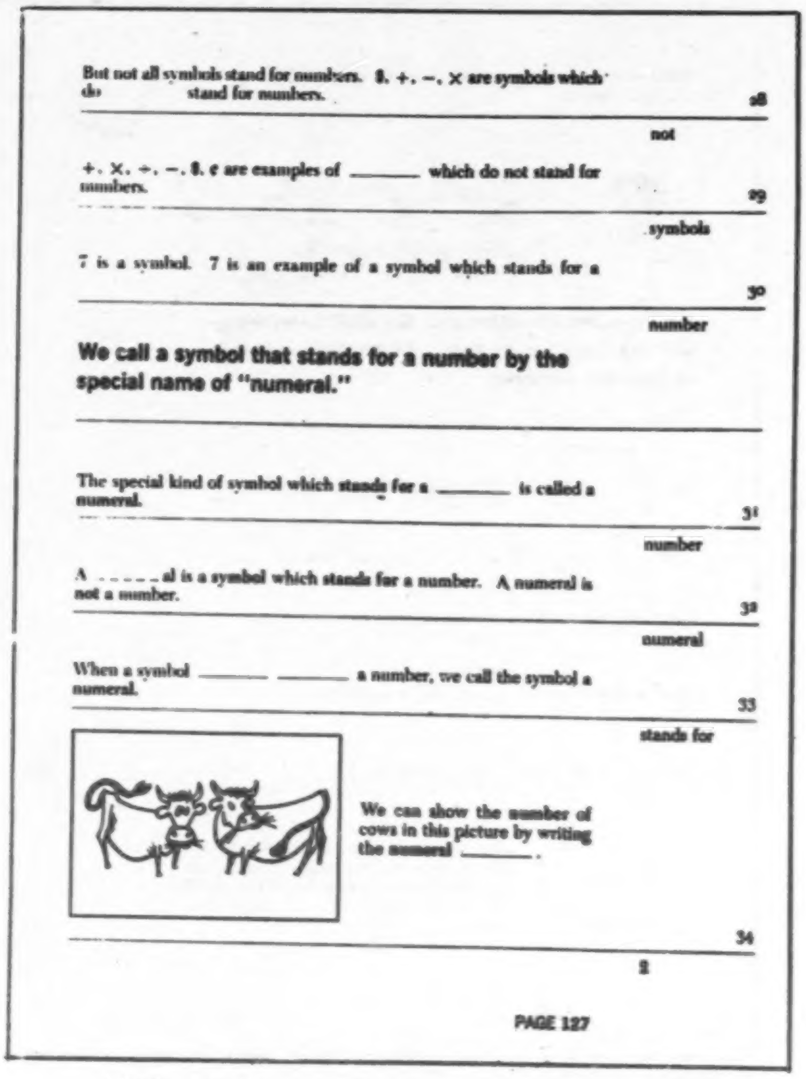
149

path

That path was new to them. They had never gone along that _______ before.

150

path



But not all symbols stand for numbers. $, +, −, × are symbols which do ________ stand for numbers. 28

not

+, ×, ÷, −, $, ¢ are examples of ________ which do not stand for numbers. 29

symbols

7 is a symbol. 7 is an example of a symbol which stands for a ________ 30

number

We call a symbol that stands for a number by the special name of "numeral."

The special kind of symbol which stands for a ________ is called a numeral. 31

number

A _ _ _ _ _ al is a symbol which stands for a number. A numeral is not a number. 32

numeral

When a symbol ________ ________ a number, we call the symbol a numeral. 33

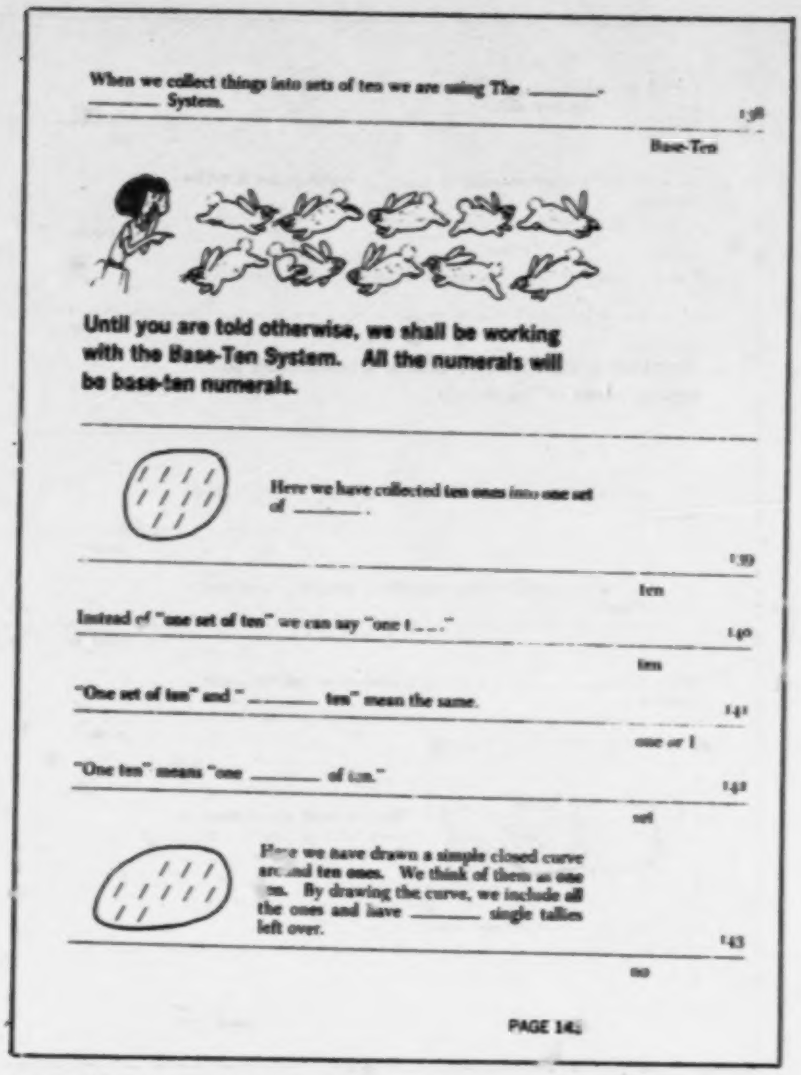
stands for

We can show the number of cows in this picture by writing the numeral ________. 34

2

PAGE 127

The above pages are uncorrected page proof from a forthcoming series of three
A, B, C). These books accompany the "Growth in Arithmetic Series" Discovery
and Numeration. Level: approximately 4th to 6th grades. Author: Dr. George
New York 17, N. Y. Available: April 1962. Details upon request.



When we collect things into sets of ten we are using The _______-_______ System. 138

Base-Ten

Until you are told otherwise, we shall be working with the Base-Ten System. All the numerals will be base-ten numerals.

Here we have collected ten ones into one set of _______. 139

ten

Instead of "one set of ten" we can say "one t_ _ _." 140

ten

"One set of ten" and "_______ ten" mean the same. 141

one or 1

"One ten" means "one _______ of ten." 142

set

Here we have drawn a simple closed curve around ten ones. We think of them as one ten. By drawing the curve, we include all the ones and have _______ single tallies left over. 143

no

PAGE 14

programed textbooks entitled "MATHEMATICS ENRICHMENT" (PROGRAMS
· Edition. They will be in color, not shown above. Topics: Sets, Geometry,
Spooner. Publisher: Harcourt, Brace + World, Inc., 750 Third Avenue,

5

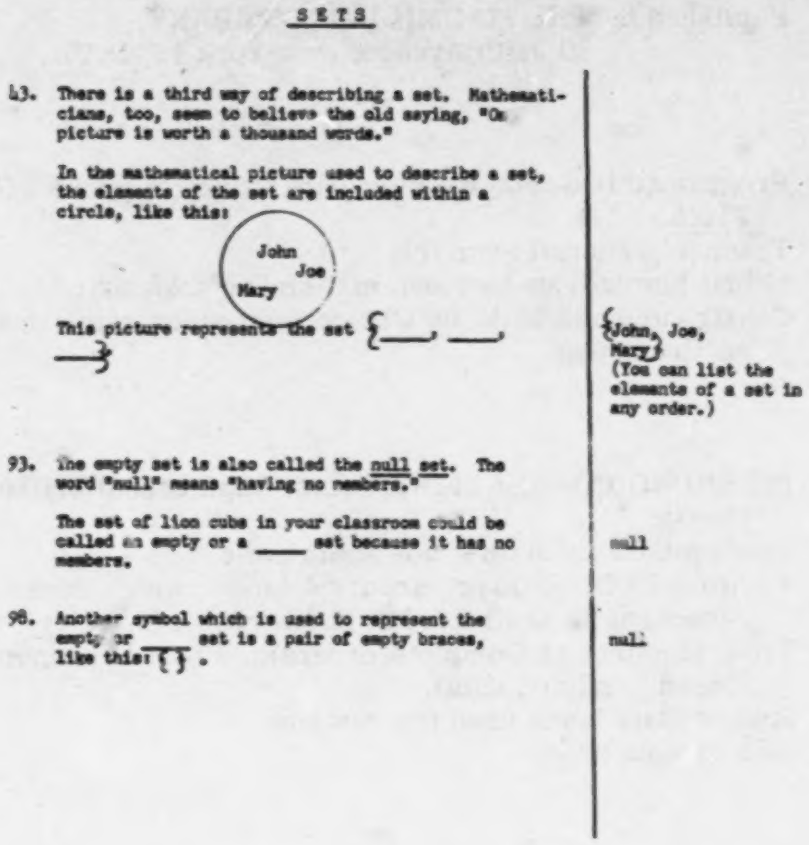
SETS Jr. H.S.
(One of the "Understanding Modern Mathematics Series")
MORTON SELTZER, Mathematics Chmn,
Weequahic (N. J.) High School
ROBERT ROOP, Roop Associates
Published by THE MACMILLAN COMPANY,
60 Fifth Avenue, New York 11, N.Y.

Programed text, 500 frames, Paperback, 96 pp., 8 1/4" X 11", $1.28.
Teacher's Manual available.
"Final test will be included in Teacher's Manual."
Constructed and Multiple Choice Responses sometimes used; no Branching.

INTENDED POPULATION: "Junior High School Mathematics classes."
Prerequisites: "Sixth grade Arithmetic."
Additional Materials required: "A binder which reveals proper responses is available but is not required."
Time Required to Complete program: 10-15 40-minute periods (based partly on data).
Student Data being used for revision.
(one sample page)

MATHEMATICS - SETS

SETS
Seltzer; THE MACMILLAN COMPANY
one sample page:



SETS

43. There is a third way of describing a set. Mathematicians, too, seem to believe the old saying, "One picture is worth a thousand words." In the mathematical picture used to describe a set, the elements of the set are included within a circle, like this: John Joe Mary This picture represents the set {____, ____, ____}	{John, Joe, Mary} (You can list the elements of a set in any order.)
93. The empty set is also called the null set. The word "null" means "having no members." The set of lion cubs in your classroom could be called an empty or a ____ set because it has no members.	null
98. Another symbol which is used to represent the empty or ____ set is a pair of empty braces, like this: { } .	null

MATHEMATICS - STATISTICS

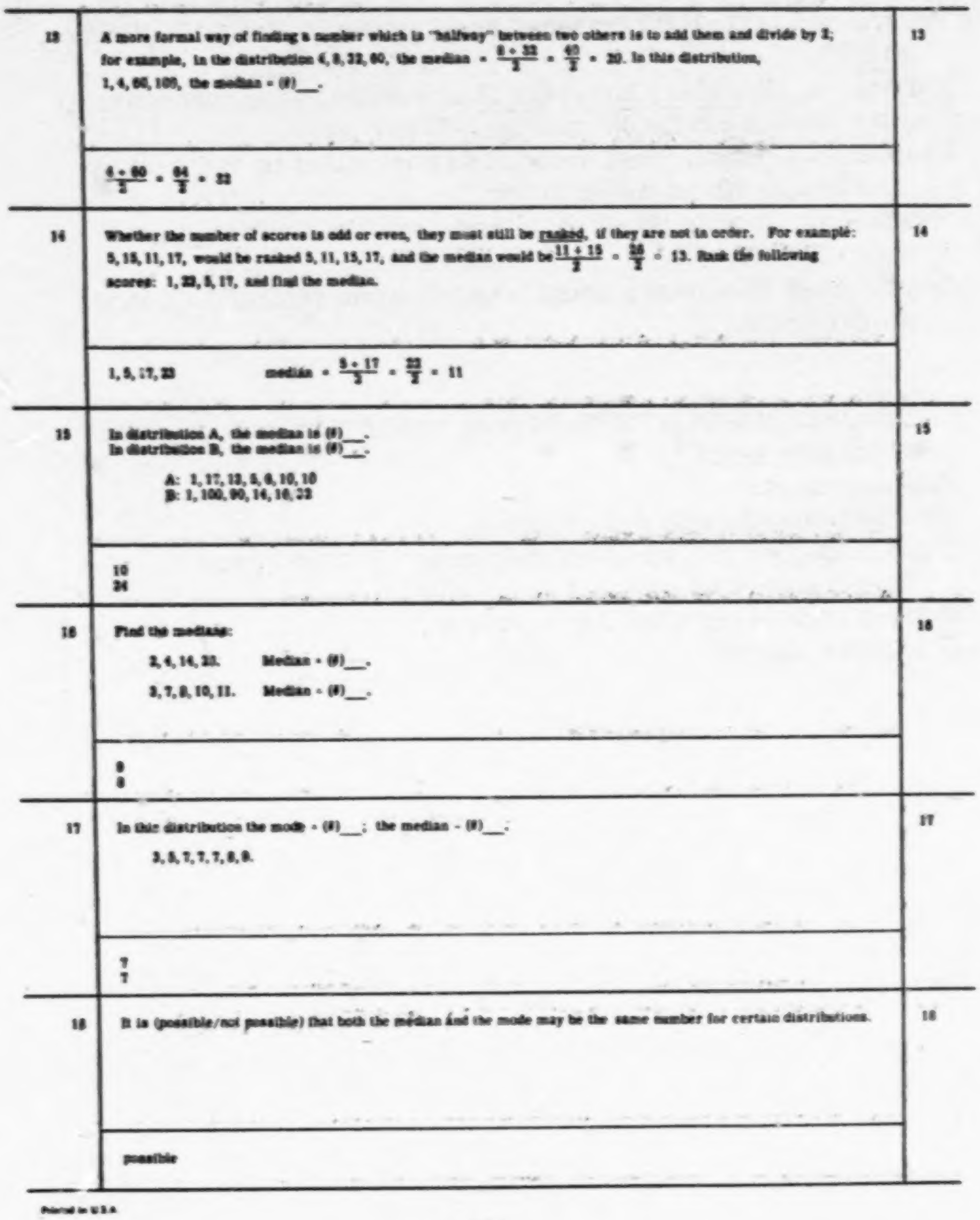
ADVANCED MATHEMATICS SERIES: INTRODUCTORY STATISTICS High School - College
JAMES L. EVANS, Vice-President, and
LLOYD E. HOMME, President; TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 1700 frames, Vinyl cover, $8\frac{1}{2}$" X 11", 185 pp., $10.00.
For use in Min/Max, Min/Max II machines; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
"No tests available other than those enclosed with course," not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "From bright high-school students to college level."
Prerequisites:
No Additional Equipment required.
Time Required to Complete program: 15 to 25 hours (based solely on data.)
Student Data being used for revision.
(2 sample pages)

MATHEMATICS - STATISTICS

ADVANCED MATHEMATICS SERIES:
INTRODUCTORY STATISTICS
Evans, Homme; TMI-GROLIER
2 sample pages:



13 A more formal way of finding a number which is "halfway" between two others is to add them and divide by 2; for example, in the distribution 4, 8, 32, 60, the median = $\frac{8+32}{2} = \frac{40}{2} = 20$. In this distribution, 1, 4, 60, 100, the median = (#)___. 13

$\frac{4+60}{2} = \frac{64}{2} = 32$

14 Whether the number of scores is odd or even, they must still be ranked, if they are not in order. For example: 5, 15, 11, 17, would be ranked 5, 11, 15, 17, and the median would be $\frac{11+15}{2} = \frac{26}{2} = 13$. Rank the following scores: 1, 23, 5, 17, and find the median. 14

1, 5, 17, 23 median = $\frac{5+17}{2} = \frac{22}{2} = 11$

15 In distribution A, the median is (#)___.
In distribution B, the median is (#)___. 15

A: 1, 17, 13, 5, 6, 10, 10
B: 1, 100, 90, 14, 10, 33

10
24

16 Find the medians: 16

2, 4, 14, 23. Median = (#)___.
3, 7, 8, 10, 11. Median = (#)___.

9
8

17 In this distribution the mode = (#)___; the median = (#)___. 17

3, 5, 7, 7, 7, 8, 9.

7
7

18 It is (possible/not possible) that both the median and the mode may be the same number for certain distributions. 18

possible

Printed in U.S.A.

43 Suppose you take 5 samples of 1,000,000 scores each. You then compute the means of the samples and get 2.3, 2.8, 3.7, 8.4, and 10.9. What is the median of this sampling distribution of means? (#)___. 43

3.7

---

44 Suppose you have a sampling distribution of some statistic, such as the variance or mode. You can calculate any statistic on this distribution, just as if it were an ordinary frequency distribution. Example: If you get the variance of several samples, and then compute the mean of these variances, you would have the mean of the sampling distribution of variances. If you get the standard deviations of several samples, and then get the mode of these standard deviations, you would have (WDS)__________. 44

the mode of a sampling distribution
of standard deviations.

---

45 Given these samples: 45

#1	#2	#3
1	2	4
3	2	1
2	2	4

The sampling distribution of means has the scores 2, __, __. The mode of the sampling distribution of means is (#)______.

2, 3
2

---

46 Given these samples: 46

A	B	C	D
1	2	3	-3
7	4	9	0
200	6	44	5

The range of the sampling distribution of medians is (#)____.

9 - 0 = 9

---

47 The standard deviation of the sampling distribution of means is important enough to have a special name. It is called the STANDARD ERROR OF THE MEAN. So if you get the means of a group of samples, and then figure the (WDS)________________ of these means, you have the (WDS)________________. 47

standard deviation
standard error of the mean.

---

48 Figure the standard deviation of the means in the samples below: 48

A	B	C	D	E
2	0	0	1	0
4	2	6	1	4

(sym)__________.

The special name for this standard deviation is (WDS)________________.

s = 1
standard error of the mean.

Printed in U.S.A.

College

PROBABILITY MODELS OF RANDOM PROCESSES
GENERAL EDUCATION Programing Staff
Published by GENERAL EDUCATION, Inc.,
96 Mt. Auburn Street, Cambridge 38, Mass.

Programed text, 800 frames, 8½" X 11", 100 pp., $15.00.
Teacher's Manual not available.
Unit, Final, Diagnostic tests not available.
Constructed Responses usually used; some Multiple Choice; Branching: "occasional opportunity to skip."

INTENDED POPULATION: "College level."
Prerequisites: None.
Additional Equipment required: "Exhibit booklet and cardboard mask are included with program."
Time Required to Complete program: 8 hours (based partly on data.)
Student Data being used for revision.
(one sample page)

MATHEMATICS - STATISTICS

PROBABILITY MODELS OF RANDOM PROCESSES
General Education Programing Staff; GENERAL EDUCATION
one sample page:

1. **Shape and parameters of normal curve**

---

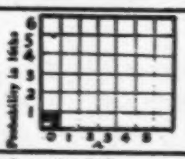
602. The list to the right is called a binomial ________________ of r, where r = number of heads, n = 4 tosses of a coin.

r	P
0	1/16
1	4/16
2	6/16
3	4/16
4	1/16

---

603. Now display this probability distribution graphically by completing the bar graph at the right.

r	P
0	1/16
1	4/16
2	6/16
3	4/16
4	1/16

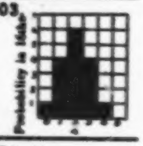


602. probability distribution

---

604. The graph you just drew is reproduced as the graph on the left side of Exhibit 12. It shows how a total probability of ________ is distributed among the different possible values of ________. The graph (as well as the table from which it was drawn) is called the ________ probability distribution for p = 1/2, n = 4.

603.



---

605. Exhibit 12 reprints the binomial probability distribution for n = 4 trials, p = 1/2. Exhibit 12 also shows another type of probability distribution we shall discuss. As Exhibit 12 indicates, this second type of probability distribution is called the ________ ________ ________.

604. 1
r
binomial

---

606. Exhibit 12 shows that the ________ probability distribution is smooth, symmetrical, and bell-like in shape; the ________ probability distribution is step-like in shape.

605. normal probability distribution

---

607. Exhibit 12 shows that the ________ probability distribution is appropriate only for integral-valued random variables (i.e., those assuming the values 0, 1, 2, etc.). The ________ probability distribution can be used for random variables that assume any value whatsoever; (e.g., 2.91324 . . .) to any desired number of decimal places).

606. normal
binomial

---

608. Exhibit 12: The graph of a ________ probability distribution is a step-like bar graph (called a histogram). The graph of a ________ probability distribution is a smooth bell-shaped curve.

607. binomial
normal

---

609. Although in principle the normal probability distribution . . . (can/cannot) be used for random variables that assume any value whatsoever, in practice, it is often used as a practical approximation to the distribution of random v________s which assume only discrete values.

608. binomial
normal

---

610. Exhibit 12: The shape of a binomial probability distribution is determined by two parameters. These parameters, listed under the graph of the binomial probability distribution, are ________ and ________ (give the algebraic symbols).

TURN PAGE

609. can
variables

MATHEMATICS - STATISTICS

PROBABILITY AND STATISTICS High School, College +

A Programmed Course of Instruction
ALBERT E. HICKEY, President, and
SANFORD M. AUTOR, Director of Programming,
Entelek, Inc.
Published by ADDISON-WESLEY PUBLISHING Co.,
Reading, Mass.

Programed text, 3000 frames, Paperback, 500 pp., 6" X 9", $3.00.
Separate Units and Teacher's Manual not yet available.
Unit, Final, Diagnostic tests not yet available.
Constructed Responses usually used; Multiple Choice Responses sometimes used; no Branching.

INTENDED POPULATION: "Senior high school, college and graduate school."
Prerequisites: "High school mathematics."
Additional Material required: Text, Probability and Statistics, by Mosteller, Rourke, and Thomas (Reading, Mass.: Addison-Wesley Publishing Co.)
Time Required to Complete program: 40 hours (based partly on data)
Student Data being used for revision.
(2 sample pages)

MATHEMATICS - STATISTICS

PROBABILITY AND STATISTICS
Hickey, Autor; ADDISON-WESLEY
2 sample pages:

PROBABILITY AND STATISTICS:
A Programmed Course of Instruction
Albert E. Hickey and Sanford M. Autor

The letters A and B can be ordered or arranged in a row as AB or _____.	BA
A and B can be ordered or arranged in a row in _____ (how many?) different ways.	2
Each different arrangement of A and B in order (AB or BA) is called a permutation. A permutation of a number of objects is any arrangement of these objects in a definite order. The _____ of A and B are AB and BA.	permutations
To "permute" objects is to arrange them in a row in a definite _____.	order
To _____ objects is to arrange them in a row in a definite order.	permute
AB and BA are permutations of the letters A and B. ABC and ACB are permutations of the three letters _____, taken all together.	A, B, and C
ABC and ACB are two possible _____ of A, B, and C, taken all together.	permutations
ABC and ACB are two permutations of A, B, and C. Other permutations of A, B, and C, taken all together, are _____, _____, _____, and _____.	BAC BCA CBA CAB
The permutations of A, B, and C, taken all together, are _____, _____, _____, _____, _____, and _____. There are _____ (how many?) permutations of A, B, and C, when taken all together.	ABC ACB BAC BCA CBA CAB 6

One random variable, X, in tossing a coin 3 times is the number of heads obtained. The first column of Panel VI-1 shows a _____ space for this experiment.

sample

A second variable, Y, in tossing a coin 3 times is the number of runs obtained.

The sample point HHH represents one run of 3 heads. The same point TTT represents one ___ of 3 tails.

run

The sample point HHH has one run. The sample point TTT also has _____ run. The sample point HHT has two _____

one
runs

HHT has two runs. The first run has exactly two H's. The second run has exactly one _____.

T

HHH has one run.
HHT has two runs.
HTT has _____ runs.
HTH has _____ runs.

two
three

HHH has exactly 3 H's and 1 run. HHT has exactly _____ H's and _____ runs. HTT has exactly _____ H and _____ runs. HTH has exactly _____ H's and _____ runs.

2 2
1 2
2 3

Refer to Panel VI-1. The 2 random variables for the experiment are the _____ and the _____ when a coin is tossed 3 times in succession.

number of heads
number of runs

Look at Panel VI-1. The random variable number of heads is denoted by _____. The random variable number of runs is denoted by _____.

X
Y

MATHEMATICS - STATISTICS

A PROGRAMMED INTRODUCTION TO STATISTICAL CONCEPTS IN PSYCHOLOGY AND THE SOCIAL SCIENCES College +
CELESTE McCOLLOUGH, Asst. Prof., and
LOCHE VAN ATTA, Assoc. Prof., Psychology Dept., Oberlin College.
Published by McGRAW-HILL BOOK COMPANY,
330 West 42nd Street, New York 36, N.Y.

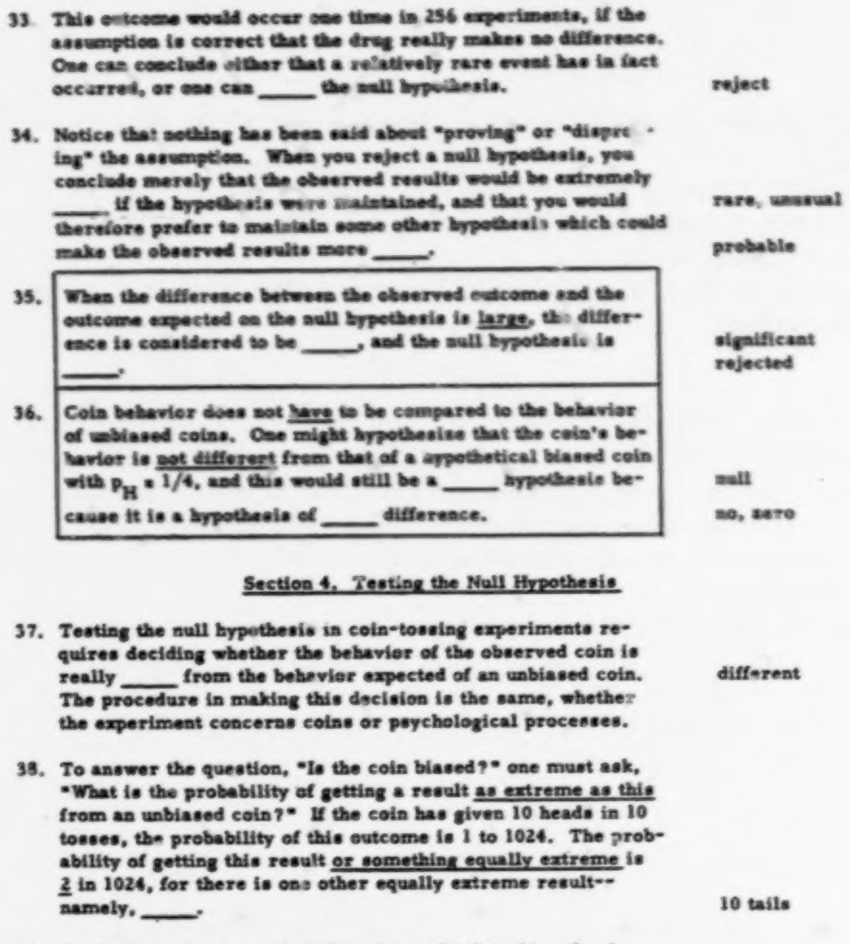
Programed text, 1,200 frames, Paperback, 6" X 9", 250 pp., $3.50
Teacher's Manual not available.
Diagnostic tests "contained in program"; pre and posttests not yet available.
Constructed Responses always used; no Multiple Choice or Branching.

INTENDED POPULATION: "College, advanced high school, adult level students of psychology, education, sociology, other social sciences and biological sciences who desire supplement covering the statistical analysis and interpretation of data in their fields."
Prerequisites:
No Additional Equipment required.
Time Required to Complete program: 20 hours (based solely on data.)
Student Data used for revision.
(one sample page)

MATHEMATICS - STATISTICS

A PROGRAMMED INTRODUCTION TO STATISTICAL CONCEPTS IN PSYCHOLOGY AND THE SOCIAL SCIENCES

McCollough, Van Atta; McGRAW-HILL
one sample page:



33. This outcome would occur one time in 256 experiments, if the assumption is correct that the drug really makes no difference. One can conclude either that a relatively rare event has in fact occurred, or one can _____ the null hypothesis.	reject
34. Notice that nothing has been said about "proving" or "disproving" the assumption. When you reject a null hypothesis, you conclude merely that the observed results would be extremely _____ if the hypothesis were maintained, and that you would therefore prefer to maintain some other hypothesis which could make the observed results more _____.	rare, unusual probable
35. When the difference between the observed outcome and the outcome expected on the null hypothesis is large, the difference is considered to be _____, and the null hypothesis is _____.	significant rejected
36. Coin behavior does not have to be compared to the behavior of unbiased coins. One might hypothesize that the coin's behavior is not different from that of a hypothetical biased coin with $p_H = 1/4$, and this would still be a _____ hypothesis because it is a hypothesis of _____ difference.	null no, zero

Section 4. Testing the Null Hypothesis

37. Testing the null hypothesis in coin-tossing experiments requires deciding whether the behavior of the observed coin is really _____ from the behavior expected of an unbiased coin. The procedure in making this decision is the same, whether the experiment concerns coins or psychological processes.	different
38. To answer the question, "Is the coin biased?" one must ask, "What is the probability of getting a result as extreme as this from an unbiased coin?" If the coin has given 10 heads in 10 tosses, the probability of this outcome is 1 to 1024. The probability of getting this result or something equally extreme is 2 in 1024, for there is one other equally extreme result--namely, _____.	10 tails
39. In other words, the probability of a perfectly unbiased coin behaving as badly as this, purely by chance, is _____ in 1024. This probability itself is low enough to warrant rejection of the null hypothesis; one would conclude that the coin is _____.	2 biased
40. If the observed result were 9 heads and 1 tail, this event would have a probability of _____, according to the Special Answer Sheet. This particular event would occur by chance about _____ time(s) in 100 such experiments, when the coin is unbiased.	10/1024 1

11-5

MATHEMATICS - STATISTICS

WHAT ARE THE CHANCES? Jr. H.S.
An Introduction to Probability
(One of the "Understanding Modern Mathematics Series")
MARTIN MOSKOWITZ, Mathematics Chairman,
Vailsburgh High School, Newark, N.J.
ROBERT ROOP, Roop Associates
Published by THE MACMILLAN COMPANY,
60 Fifth Avenue

Programed text, 500 frames, Paperback, 8 1/4" X 11", 96 pp., $1.28.
Teacher's Manual will be available.
Final test will be included in Teacher's Manual.
Constructed and Multiple Choice Responses sometimes used; no Branching.

INTENDED POPULATION: "Junior high school mathematics classes."
Prerequisites: "Sixth grade arithmetic."
Additional Equipment Required: "A binder which reveals proper responses is available but is not required."
Time Required to Complete program: 10 to 15 forty minute periods (based partly on data).
Student Data being used for revision.
(one sample page)

MATHEMATICS - STATISTICS

WHAT ARE THE CHANCES?
Moskowitz, Roop; THE MACMILLAN COMPANY
one sample page:

WHAT ARE THE CHANCES?

62. On the probability scale the range of values goes from 0 to 1. The probability value of any event must be either ____ or ____ or a number between these two.	0 or 1
63. You already know the kind of numbers used for values between 0 and 1. Some of these numbers are: 1/8, 1/4, 3/8, 1/2, 3/5, 5/8, 7/10, 3/4. This kind of number is called a __?__ . a. proper fraction b. mixed number c. improper fraction	a. proper fraction
64. Most events are neither certain nor impossible. Thus most probability values are represented by proper ________.	fractions

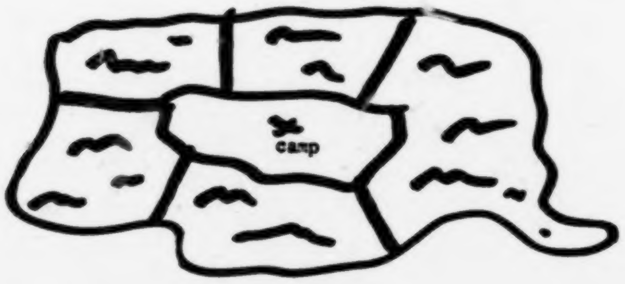
Try Your Hand

4. Match the probability values in the right column with the word descriptions of probability values in the left column. Only one number can be matched with each description.

1. Just as likely as not ____
2. Can't happen ____
3. Sure thing ____
4. Good bet ____
5. Probably won't happen ____
6. Can't fail ____
7. 50-50 ____
8. Impossible ____
9. One out of two ____
10. Certain success ____

1/2
1
0
1/10
9/10

10. Jack camped overnight on the island pictured below. When he left home, he asked his father to meet him at the bridge, but he forgot to tell him which bridge. What is the probability that the father waited at the right bridge?



TRIGONOMETRY (AN INTRODUCTORY COURSE) **H.S.**
**DAVID L. LUCKHAM, Research Assistant at
Massachusetts Institute of Technology**
**Published by ENCYCLOPAEDIA BRITANNICA FILMS, Inc.
1150 Wilmette Avenue, Wilmette, Illinois**

Programed text, 4900 frames, Paperback, 835 pp., 8½" X 11", $13.00.
For use in KONCEPT-O-GRAPH machine; program reusable.
Answer sheets available.
Teacher's Manual available; free with classroom order.
Diagnostic tests available @ $1.50 per package of 30, not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: 11th grade.
Prerequisites: General mathematics background.
Additional Equipment required: Student Supplement, essential to the course, included in price above.
Time Required to Complete program: 80 classroom hours (based partly on data).
Student Data being used for revision.
(5 sample pages)

MATHEMATICS - TRIGONOMETRY

TRIGONOMETRY (AN INTRODUCTORY COURSE)
Luckham; ENCYCLOPAEDIA BRITANNICA FILMS
5 sample pages:

578. Figure 140 again shows the graph of $y=2x$. The graph gives us a picture of how the function behaves. That is, it tells us how the members of our second set (represented by y coordinates) are related to the members of our first set (that is, the set of all real numbers). If we take any point S on the graph, we will find that its _____ coordinate is twice its _____ coordinate. This is precisely what the function $y=2x$ says.

y,
x

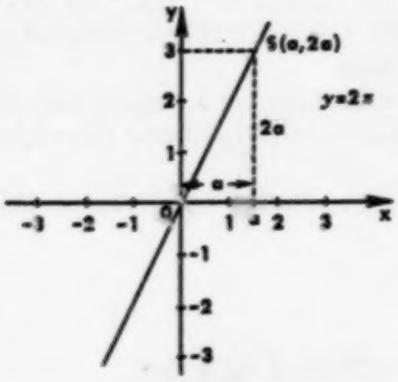


Figure 140

579. Let us now plot the graph of the function $y=\frac{x}{2}+1$. This function sets up a correspondence between the real numbers (which are represented by x coordinates) and a second set of numbers which we will represent by _____ coordinates.

y

580. We start by computing the values of y corresponding to some of the possible values that x can take on. We choose both negative and positive values of x and we choose them so that they are evenly spaced. Compute the y coordinates in Figure 141.

x	$y=x/2+1$
-4	
-3	
-2	
-1	
0	
1	
2	

Figure 141

x	$y=x/2+1$
-4	-1
-3	$-1/2$
-2	0
-1	$1/2$
0	1
1	$3/2$
2	2

561. Now the graph of the function $y=\frac{x}{2}+1$ consists of all those points in the plane whose y coordinates are related to their x coordinates by the function. That is, suppose the x coordinate of point P is a. Then, if the y coordinate of point P is ______, point P will lie on the graph of the function.

$\frac{a}{2}+1$

562. Thus, the points $A(-4, -1)$, $B(-3, -\frac{1}{2})$, $C(-2, 0)$, $D(-1, \frac{1}{2})$, $E(0, 1)$, $F(1, \frac{3}{2})$, and $G(2, 2)$ all lie on the graph of the function $y=\frac{x}{2}+1$. Plot these points on Figure 142.

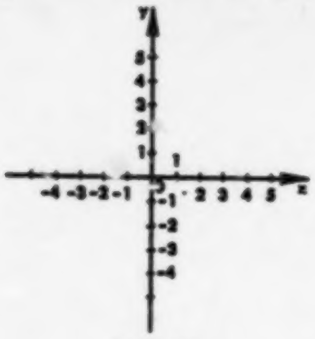
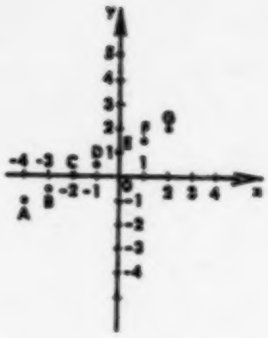


Figure 142



563. We see from the answer to the previous question, the points A, B, C, D, E, F, and G, which lie on the graph of the function $y=$______, all lie in a straight line. We could get a more accurate picture of the graph of this function simply by taking further possible values of x. For instance, $-\frac{1}{2}$, $-\frac{1}{4}$, $\frac{1}{4}$, $\frac{1}{2}$, etc. and computing the corresponding values of y under the present relating function. The more points we plot, the more accurate our picture of the graph of the function will be.

$\frac{x}{2}+1$

564. However, we cannot possibly plot all the pairs of x and y coordinates related by the function. When we have plotted a suitable number of pairs for both positive and ______ values of x, we can already see the shape of the ______ of the function.

negative,
graph

585. We then simply fill in or complete the picture of the graph by drawing the smoothest curve possible through all the points we have plotted. Figure 143 shows the graph of the function $y=\frac{x}{2}+1$. We see that this graph is again a __________ ______.

straight line

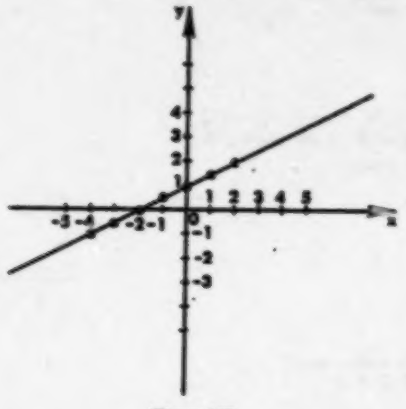


Figure 143

586. Figure 144 is the graph of the function $y=2x$. Figure 145 is the graph of the function $y=\frac{x}{2}+1$. We see that both graphs are straight lines. However, there are also some differences in the graphs. For example, the origin does not lie on the graph of the function $y=$______.

$\frac{x}{2}+1$

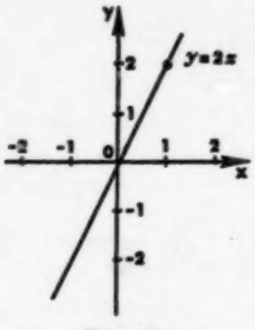


Figure 144

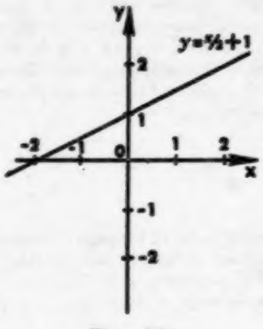


Figure 145

587. Again, looking at Figures 144 and 145, we see that the slope of the graph of $y=2x$ is much larger or steeper than the slope of the graph of the function $y=\frac{x}{2}+1$. This means that as we travel along the x-axis in the positive direction the y coordinates of the function $y=2x$ are increasing more rapidly than the y coordinates of the function $y=\frac{x}{2}+1$. Of course, we would expect this since the y coordinates of the first function are ____________ the corresponding x coordinates, whereas the y coordinates of the second function are only one unit more than ______ the corresponding x coordinates.

twice (or double),
half

588. It is even easier to compare the behavior of two functions if we plot their graphs on the same pair of axes. Look at the Figure 146. We have labeled the graph of the function $y=2x$, ①, and the graph of the function $y=\frac{x}{2}+1$, ②. It is now easy to see that the y coordinates of graph ① are ____________ more rapidly than the y coordinates of graph ②.

increasing

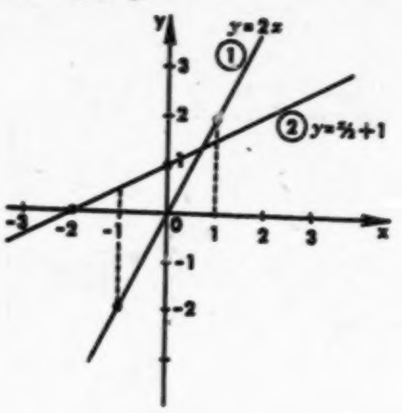


Figure 146

589. To make this clear, look at Figure 146 again. When $x=-1$, the y coordinate of graph ① is negative, whereas the y coordinate of graph ② is ____________. By the time we have reached the point $x=1$ on the x-axis, the y coordinate of graph ① is positive and ____________ than the y coordinate of graph ②. We can express this by saying that as we move along the x-axis in the positive direction, the y coordinates of graph ① overtake the y coordinates of graph ②.

positive,
larger

590. At what point does the graph of the function $y=\frac{x}{2}+1$ cut the x-axis? At what point does the graph cut the y-axis?

$(-2, 0)$,
$(0, 1)$

591. We are now going to plot the graph of the function $y=\frac{x}{2}+\frac{1}{2}$. Complete Figure 147.

x	$y=\frac{x}{2}+\frac{1}{2}$
-2	
-1	
0	
1	
2	

Figure 147

x	$y=\frac{x}{2}+\frac{1}{2}$
-2	$-\frac{1}{2}$
-1	0
0	$\frac{1}{2}$
1	1
2	$\frac{3}{2}$

592. Plot the graph of the function $y=\frac{x}{2}+\frac{1}{2}$ on Figure 148. At what point does this graph cut the x-axis? At what point does this graph cut the y-axis?

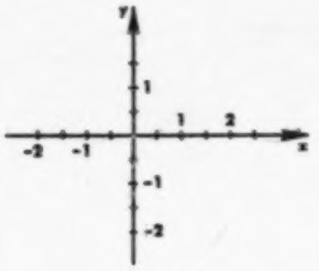
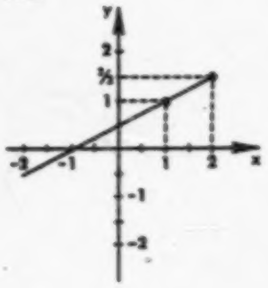


Figure 148

$(-1, 0)$,
$(0, \frac{1}{2})$



593. Is the graph of the function $y=\frac{x}{2}+\frac{1}{2}$ a straight line? Would you expect the y coordinates of this function to increase faster than the y coordinates of the function $y=2x$?

yes,
no

VECTORS H.S. + +

BASIC SYSTEMS, INC., 2900 Broadway,
New York 25, N.Y.
Published by APPLETON-CENTURY-CROFTS,
Division of Meredith Publishing Company,
34 West 33rd Street, New York 1, N.Y;

Programed text, 495 frames, Paperback, 175 pp., 6" X 9", $2.75.

Teacher's Manual available, free upon adoption of program.

Final test available, free upon adoption of program, not reusable.

Constructed Responses usually used; some Multiple Choice; some Branching.

INTENDED POPULATION: "College physics, superior high school physics courses."

Prerequisites: "Algebra, elementary concepts of trigonometry and coordinate geometry."

Additional Material required: "Graph paper, ruler. Necessary tables supplied within the program."

Time Required to Complete program: 5 hours (based partly on data).

Student Data being used for revision.

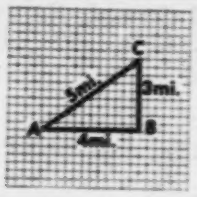
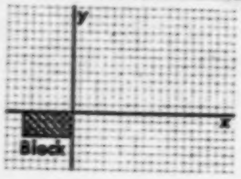
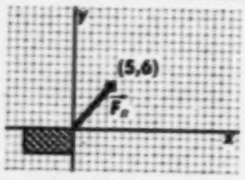
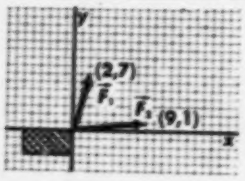
(one sample page)

MATHEMATICS - VECTORS

VECTORS

Basic Systems, Inc.; APPLETON-CENTURY-CROFTS
one sample page:

VECTORS: BASIC SYSTEMS

A boy walks from *A* to *B* to C. What is the magnitude of his displacement? What is the magnitude of the distance he has walked?  24	five miles seven miles 24
Explain why displacements can be represented by arrows. 54	Displacements are vectors and therefore can be represented by arrows. 54
Suppose that there are three forces on an object, $\vec{F}_1 = (7, 0)$, $\vec{F}_2 = (2, 6)$, and $\vec{F}_3 = (2, 1)$. A single force that will have the same effect as $\vec{F}_1$, $\vec{F}_2$, and $\vec{F}_3$ is (,). 204	(11, 7) 204
Take a sheet of graph paper. Draw and label coordinate axes. Draw in a picture of a block. 205	 205
Draw a vector representing a force that has the same effect as these forces: $\vec{F}_1 = (2, 3)$, $\vec{F}_2 = (0, 1)$, and $\vec{F}_3 = (3, 2)$. $\vec{F}_R = (\quad , \quad)$. 206	 206 $F_R = (5, 6)$
Again draw and label a coordinate system on a sheet of graph paper. Draw a block in the third quadrant. Draw vectors representing the forces $\vec{F}_1 = (2, 7)$ and $\vec{F}_2 = (9, 1)$. 207	 207

MATHEMATICS - LOGIC

WFF 'N PROOF: THE GAME OF MODERN LOGIC Elementary - College +

Programmed text materials incorporated into 24 games to teach mathematical logic.

LAYMAN E. ALLEN, Professor of Law,
Yale Law School, New Haven, Conn.
Available from author.

Programed text, 24 games (infinite number of frames can be generated in each game), Paperback, 108 pp., 5" X 8", $5.00.

Teacher's Manual not available.

Unit, Final, Diagnostic Tests not available.

Constructed Responses and Branching usually used; some Multiple Choice.

INTENDED POPULATION: "Early games have been mastered by first graders, the last games have interested and challenged university teachers of mathematical logic."

Prerequisites: None.

Additional Equipment Required: Lettered cubes (included).

Time Required to Complete entire set of games: "It may take years to become an excellent player" (Based partly on data).

Student Data being used for revision.

(one sample page)

The lettered cubes

MATHEMATICS - LOGIC

WFF 'N PROOF: THE GAME OF MODERN LOGIC
LAYMAN E. ALLEN
one sample page:

Definition of a WFF

A given expression is a WFF if and only if
C1) it is a 'p', 'q', 'r', or 's'; or
C2) it is the expression formed when an 'N' is immediately followed by only one WFF; or
C3) it is the expression formed when a 'C', 'A', 'K', or 'E' is immediately followed by only two WFFs.

Questions	Answers
Q1 Is the expression 'p' a WFF?	A1 Yes, a 'p' is a WFF by clause 1 (C1) of the definition of a WFF.
Q2 Is the expression 'o' a WFF?	A2 No, there is no clause in the definition of a WFF that indicates that an 'o' is a WFF, and a given expression is a WFF only if that expression is a WFF by one of the clauses of the definition.
Q3 Is 'Ns' a WFF?	A3 Yes, an 's' is a WFF by clause 1 of the definition of a WFF; and, therefore, an 'Ns' is a WFF by clause 2. In other words: Conclusions — Reasons 1. 's' is a WFF. — C1 2. 'Ns' is a WFF. — 1,C2 The first reason, namely 'C1', indicates that 's' is a WFF because of clause 1 of the definition of a WFF. The second reason, namely '1,C2', indicates that 'Ns' is a WFF because of the first conclusion, namely that 's' is a WFF, and clause 2 of the definition of a WFF.
Q4 Is 'No' a WFF?	A4 No, there is no clause in the definition of a WFF that indicates that an expression containing an 'o' is a WFF.
Q5 sN? (Hereafter, an expression followed by a question mark will be an abbreviation for the question: "Is this expression a WFF?" Thus, 'sN?' is an abbreviation for: "Is 'sN' a WFF?"	A5 No, there is no clause in the definition of a WFF that indicates that an expression ending with a capital lotter is a WFF.
Q6 oN?	A6 No, 'oN' is not a WFF (for the reason specified in answer A4 and also for the reason specified in answer A5). See A4 and A5.
Q7 NNo?	A7 No. See A4.
Q8 NsN?	A8 No. See A5.
Q9 NoN?	A9 No. See A4 and A5.

MATHEMATICS - LOGIC

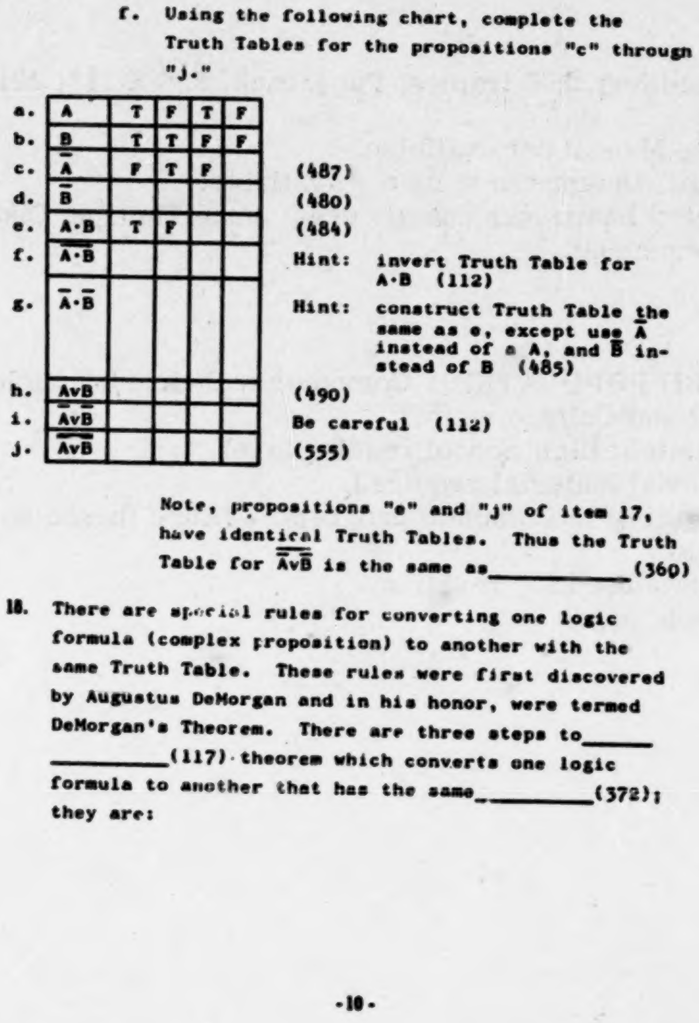
BASIC SYMBOLIC LOGIC (AUTO-TEXT) H.S. +
JAMES L. BECKER, Coordinator of
Programmed Instruction, RCA
Published by RCA EDUCATIONAL SERVICES,
Camden 8, New Jersey

Programed text, 200 frames, Paperback, $8\frac{1}{2}$" X 11", 221 pp., $1.25.
Teacher's Manual not available.
Unit, Final, Diagnostic tests not available.
Constructed Responses usually used; some Multiple Choice and Branching.

INTENDED POPULATION: Computer technicians, High School and College math."
Prerequisites: High School reading level.
No Additional Material required.
Time Required to Complete program: 2 hours (based solely on data).
Student Data used for revision.
(one sample page)

MATHEMATICS - LOGIC

BASIC SYMBOLIC LOGIC (AUTO-TEXT)
Becker; RCA EDUCATIONAL SERVICES
one sample page:



f. Using the following chart, complete the Truth Tables for the propositions "c" through "j."

a.	A	T	F	T	F	
b.	B	T	T	F	F	
c.	$\overline{A}$	F	T	F		(487)
d.	$\overline{B}$					(480)
e.	A·B	T	F			(484)
f.	$\overline{A\cdot B}$					Hint: invert Truth Table for A·B (112)
g.	$\overline{A}\cdot\overline{B}$					Hint: construct Truth Table the same as e, except use $\overline{A}$ instead of a A, and $\overline{B}$ instead of B (485)
h.	AvB					(490)
i.	$\overline{A}v\overline{B}$					Be careful (112)
j.	$\overline{\overline{A}v\overline{B}}$					(555)

Note, propositions "e" and "j" of item 17, have identical Truth Tables. Thus the Truth Table for $\overline{\overline{A}v\overline{B}}$ is the same as____________(360)

18. There are special rules for converting one logic formula (complex proposition) to another with the same Truth Table. These rules were first discovered by Augustus DeMorgan and in his honor, were termed DeMorgan's Theorem. There are three steps to______ __________(117) theorem which converts one logic formula to another that has the same__________(372); they are:

-10-

MATHEMATICS - MISCELLANEOUS

AN INTRODUCTION TO GROUPS AND FIELDS H.S. - Coll. +
A Programmed Unit in Modern Mathematics
BOYD EARL, Teacher of mathematics, high-school and Bucknell University.
Published by McGRAW-HILL BOOK COMPANY,
330 West 42nd Street, New York 36, N.Y.

Programed text, 1,500 frames, Paperback, 6" X 9", 400 pp., $4.00 - $4.50.
Teacher's Manual available.
Unit and Final Tests "contained in Teachers Manual"
Diagnostic tests "contained in program"
Constructed Responses usually used; some Multiple Choice; no Branching

INTENDED POPULATION: "10-12 grade math students; advanced high-school work in modern topics; college students; secondary school teachers of math - training and refresher self-study; business and technical groups; training programs (industrial and military)."
Prerequisites: "Working knowledge of set theory and set notation"
Additional Equipment required: "Ruler and graph paper"
Time Required to Complete program: 48 hours (based solely on data.)
Student Data being used for revisions.
(one sample page)

MATHEMATICS - MISCELLANEOUS

AN INTRODUCTION TO GROUPS AND FIELDS

A Programmed Unit in Modern Mathematics
Earl; McGRAW-HILL
one sample page:

GROUPS AND FIELDS - SAMPLE FRAMES (preliminary version)

Q2.492

Given a set S and a binary relation R in S, R is reflexive if and only if for all $x \in S$, ________

A2.492

$(x,x) \in R$ or $x\,R\,x$

Q2.493

Let $S = \{1,2,3,4\}$. If a binary relation R in S is to be reflexive, what elements must be in R?

A2.493

(1,1) (2,2) (3,3) (4,4)

Q2.494

Given a set S and a binary relation R in S, R is symmetric if and only if whenever $(x,y) \in R$, then _____

A2.494

$(y,x) \in R$

Q2.495

Let $S = \{1,2,3,4\}$ and $R = \{(1,1)\ (2,2)\}$ Is R symmetric? Why?

A2.495

Yes, whenever $(x,y) \in R$, then $(y,x) \in R$.

Q2.496

Given a set S and a binary relation R in S, R is transitive if and only if whenever $(x,y) \in R$ and $(y,z) \in R$, then ________.

AN AUTO-INSTRUCTIONAL INTRODUCTION TO FORTRAN PROGRAMMING College +

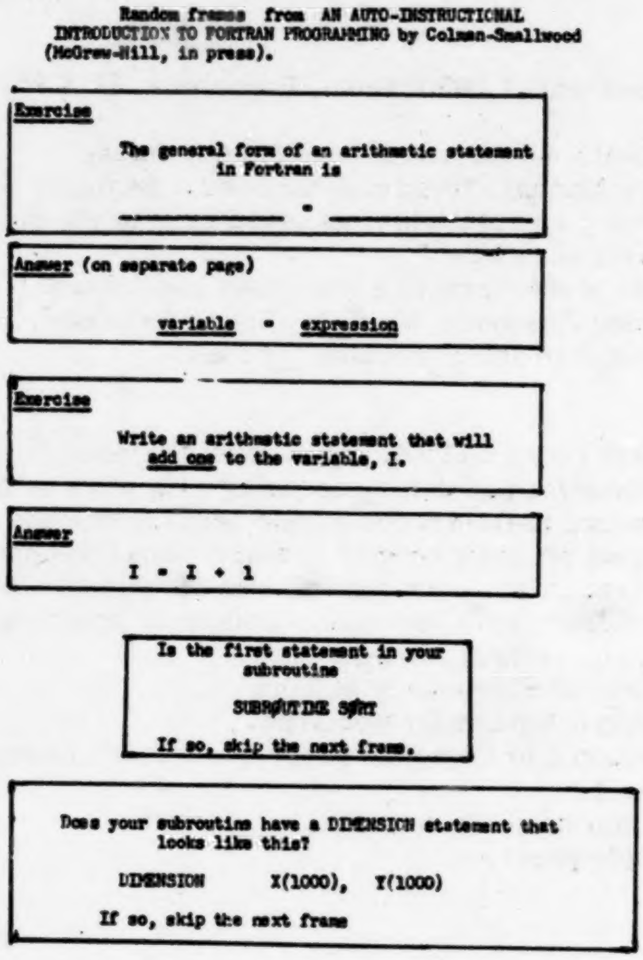
HARRY L. COLMAN, Technical Writer and Editor and
CLARENCE P. SMALLWOOD, Educational Consultant;
Western Data Processing Center, UCLA.
Published by McGRAW-HILL BOOK COMPANY,
330 West 42nd Street, New York 36, N.Y.

Programed text, 1,000 frames, Paperback, 6" X 9", 200 pp., $3.95
May be available for use in machines in future.
Teacher's Manual: "Program includes a Beginner FORTRAN reference manual, which is keyed back to the program for purposes of review."
Diagnostic tests: "practice exercises in program."
Constructed Response, Multiple Choice Response, No Response and Branching all used.

INTENDED POPULATION: "Any level beginner in computer programming and data processing with little or no experience in field; good supplement for science courses requiring programming of research data: business administration students; teachers and administrators who want to learn fundamentals of computer programming; gifted high-school students."
Prerequisites: Elementary algebra.
No Additional Equipment Required.
Time Required to Complete program: 6 hours (based partly on data.)
Student Data used for revision.
(one sample page)

APPLIED MATHEMATICS

AN AUTO-INSTRUCTIONAL INTRODUCTION TO FORTRAN PROGRAMMING
Colman, Smallwood; McGRAW-HILL
one sample page:



Random frames from AN AUTO-INSTRUCTIONAL INTRODUCTION TO FORTRAN PROGRAMMING by Colman-Smallwood (McGraw-Hill, in press).

Exercise

The general form of an arithmetic statement in Fortran is

______________ = ______________

Answer (on separate page)

variable = expression

Exercise

Write an arithmetic statement that will add one to the variable, I.

Answer

```
I = I + 1
```

Is the first statement in your subroutine

```
SUBRØUTINE SØRT
```

If so, skip the next frame.

Does your subroutine have a DIMENSION statement that looks like this?

```
DIMENSION       X(1000),   Y(1000)
```

If so, skip the next frame

APPLIED MATHEMATICS

YOUR PERSONAL TUTOR IN: 7th grade
CHARTS & GRAPHS
INRAD, P.O. Box 4456, Lubbock, Texas

Programed text, 300 frames, Paperback, $ (?).
No Teacher's Manual available.
Final test available; reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "7th grade."
Prerequisites:
No Additional Materials required.
Time Required to Complete program: 5 hours (based partly on data.)
Student Data being used for revision.
(one sample page)

APPLIED MATHEMATICS

YOUR PERSONAL TUTOR IN: CHARTS & GRAPHS
INRAD
one sample page:

EXTRACTS FROM CHARTS AND GRAPHS

11. A graph that uses bars to compare facts is a ______ graph.

bar

12. Bars drawn on a ________ are used to compare facts.

graph

13. A bar graph uses ______ to compare facts.

bars

14. A bar graph is a drawing that compares facts by using the drawing of bars on a ______

graph

15. Pictographs use pictures called symbols to ______________ facts.

show or compare

16. Pictographs compare facts by using ______ instead of bars.

pictures or symbols

MUSIC

READING MUSIC Elementary
DR. JOHN M. BATCHELLER,
BETTY LOU DUBOIS, GPTC
Published by GENERAL PROGRAMMED TEACHING
CORPORATION,
1719 Girard NE, Albuquerque, New Mexico

Programed text, 1100 frames, Paperback, $8\frac{1}{2}$" X 11", 220 pp., $ (?) .
For use in GPTC and TMI machines; program reusable.
Teacher's Manual: "Instructions to the teacher are included in the preface."
Constructed and Multiple Choice Responses usually used; no Branching.

INTENDED POPULATION: "4th and 5th grade students."
Prerequisites: "3rd grade reading level; no previous experience with music required."
No Additional Material required.
Time Required to Complete program: 10 to 15 hours (based solely on data.)
Student Data being used for revision.
(one sample page)

MUSIC

READING MUSIC

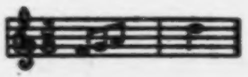
Batcheller, DuBois; GENERAL PROGRAMMED TEACHING CORPORATION

one sample page:

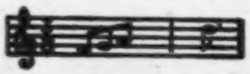
597)

Which illustration is correct?

(A)



(B)



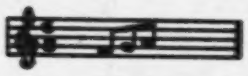
Circle.

[✓ (A)]

(A) (B)

598)

Circle below the note which can be used to complete the measure.

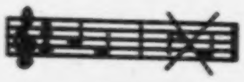


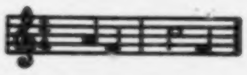
[✓ ♩.]

♪ ♩ ♩.

599)

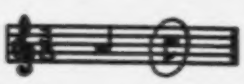
Cross out the measure having an error in it.

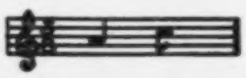




600)

Circle the eighth note below.





MUSIC

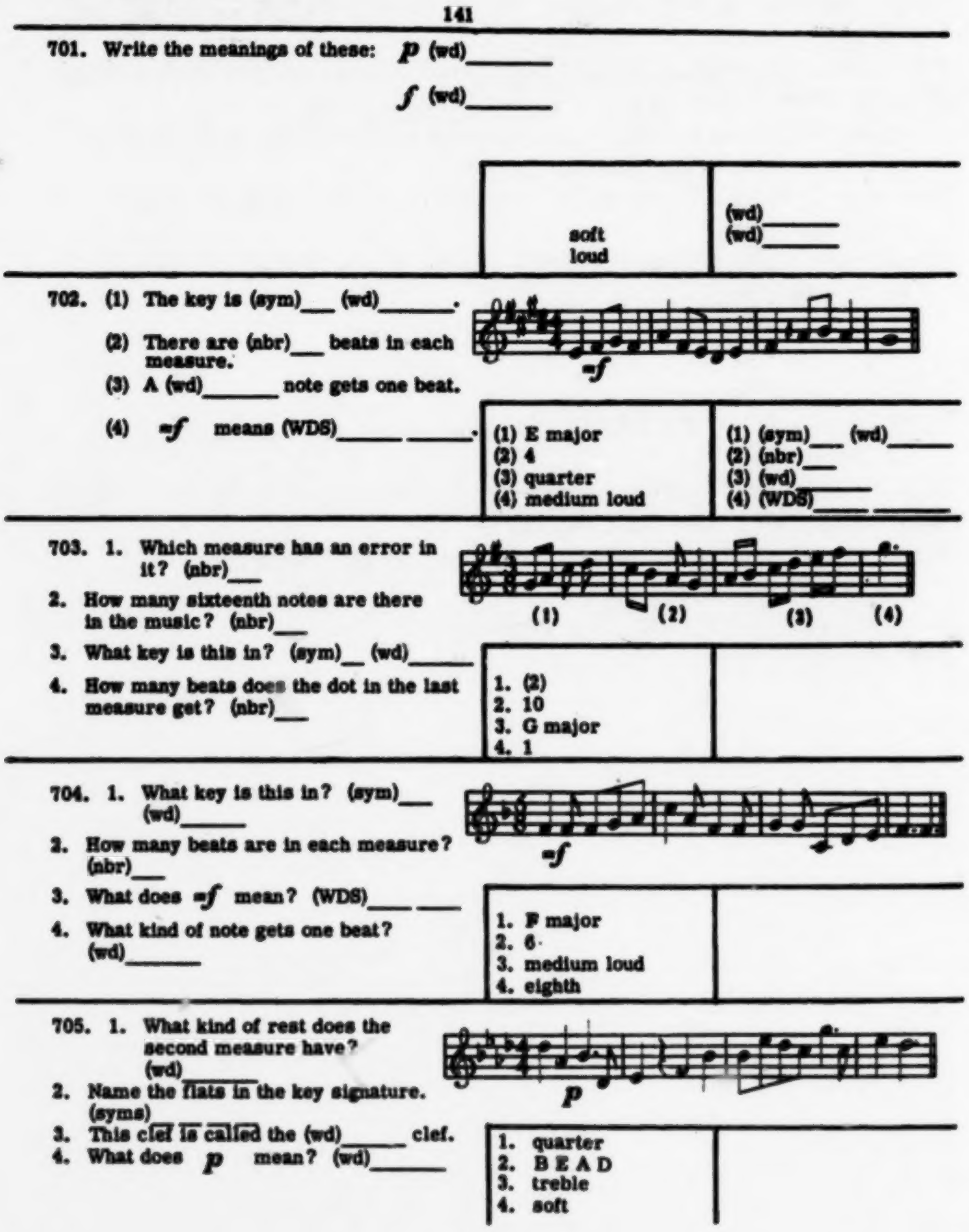
FUNDAMENTALS OF MUSIC Elementary ++
NAN CHAKERIAN, Programer, TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 706 frames, Vinyl cover, 8½" X 11", 142 pp., $7.50.
For use in Min/Max, Min/Max II machines; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
"No tests available other than those enclosed with course," not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "Beginners of all ages from 11 years up."
Prerequisites: "Ability to read and follow simple instructions."
No Additional Equipment required.
Time Required to Complete program: 6 to 8 hours (based solely on data.)
Student Data being used for revision.
(one sample page)

MUSIC

FUNDAMENTALS OF MUSIC
Chakerian; TMI-GROLIER
one sample page:



141

701. Write the meanings of these: *p* (wd)______

f (wd)______

soft loud	(wd)______ (wd)______

702. (1) The key is (sym)___ (wd)______.

(2) There are (nbr)___ beats in each measure.

(3) A (wd)______ note gets one beat.

(4) *mf* means (WDS)______ ______.

mf

(1) E major (2) 4 (3) quarter (4) medium loud	(1) (sym)___ (wd)______ (2) (nbr)___ (3) (wd)______ (4) (WDS)______ ______

703. 1. Which measure has an error in it? (nbr)___

2. How many sixteenth notes are there in the music? (nbr)___

3. What key is this in? (sym)__ (wd)______

4. How many beats does the dot in the last measure get? (nbr)___

(1) (2) (3) (4)

1. (2) 2. 10 3. G major 4. 1	

704. 1. What key is this in? (sym)___ (wd)______

2. How many beats are in each measure? (nbr)___

3. What does *mf* mean? (WDS)____ ____

4. What kind of note gets one beat? (wd)______

mf

1. F major 2. 6 3. medium loud 4. eighth	

705. 1. What kind of rest does the second measure have? (wd)______

2. Name the flats in the key signature. (syms)

3. This clef is called the (wd)______ clef.

4. What does *p* mean? (wd)______

p

1. quarter 2. B E A D 3. treble 4. soft	

PROGRAMING

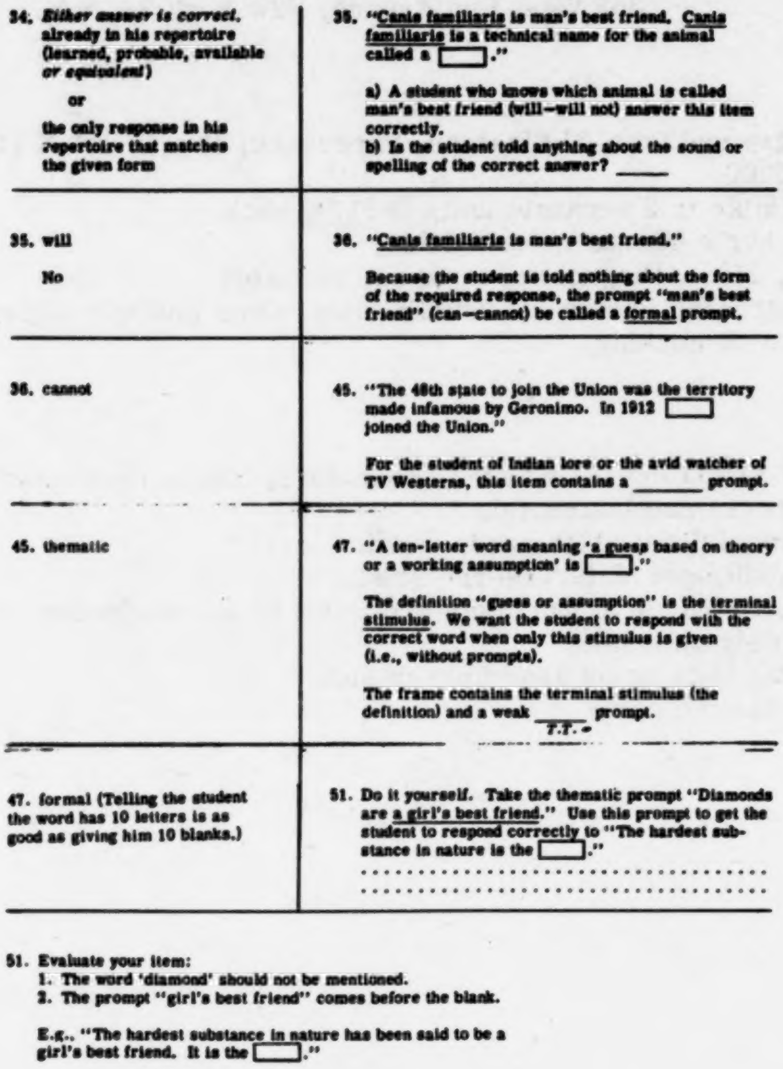
A PROGRAMED PRIMER ON PROGRAMING, VOL I AND II
SUSAN MEYER MARKLE,
LEWIS D. EIGEN,
P. KENNETH KOMOSKI, The Center for Programed Instruction, Inc.
Published by The CENTER for PROGRAMED INSTRUCTION, Inc., 365 West End Avenue, New York 24, N.Y.

Programed text, 343 frames, Paperback, 72 pp., 8½" X 11", $2.00.
Available in 2 separate units @ $1.00 each.
Teacher's Manual not available.
Unit, Final, Diagnoistic tests not available.
Constructed Responses usually used; some Multiple Choice and Branching.

INTENDED POPULATION: "Educators, others interested in programed instruction."
Prerequisites: "11th grade reading level."
No Additional Materials required.
Time Required to Complete program: 2½ hours. (based solely on data).
Student Data being used for revision.
(one sample page)

PROGRAMING

A PROGRAMED PRIMER ON
PROGRAMING, VOL I AND II
Markle, Eigen, Komoski; The CENTER for PROGRAMED INSTRUCTION
one sample page:



34. *Either answer is correct.* already in his repertoire (learned, probable, available *or equivalent*) or the only response in his repertoire that matches the given form	35. "Canis familiaris is man's best friend. Canis familiaris is a technical name for the animal called a ☐." a) A student who knows which animal is called man's best friend (will—will not) answer this item correctly. b) Is the student told anything about the sound or spelling of the correct answer? _____
35. will No	36. "Canis familiaris is man's best friend." Because the student is told nothing about the form of the required response, the prompt "man's best friend" (can—cannot) be called a formal prompt.
36. cannot	45. "The 48th state to join the Union was the territory made infamous by Geronimo. In 1912 ☐ joined the Union." For the student of Indian lore or the avid watcher of TV Westerns, this item contains a _______ prompt.
45. thematic	47. "A ten-letter word meaning 'a guess based on theory or a working assumption' is ☐." The definition "guess or assumption" is the terminal stimulus. We want the student to respond with the correct word when only this stimulus is given (i.e., without prompts). The frame contains the terminal stimulus (the definition) and a weak _____ prompt. T.T.
47. formal (Telling the student the word has 10 letters is as good as giving him 10 blanks.)	51. Do it yourself. Take the thematic prompt "Diamonds are a girl's best friend." Use this prompt to get the student to respond correctly to "The hardest substance in nature is the ☐." . . . .

51. Evaluate your item:
1. The word 'diamond' should not be mentioned.
2. The prompt "girl's best friend" comes before the blank.

E.g., "The hardest substance in nature has been said to be a girl's best friend. It is the ☐."

PROGRAMING

PROGRAMED INSTRUCTION: WHAT IT IS AND HOW IT WORKS

OHMER MILTON, Associate Professor, University of Tenn., Knoxville, Tenn. and

LEONARD J. WEST, Associate Professor, Southern Illinois Univ., Carbondale, Ill.

Published by HARCOURT, BRACE AND WORLD, Inc.,
750 Third Avenue, New York 17, N.Y.

Programed Text, 65 frames, Paperback, 32 pp., 3 7/8" X 8 7/8", .32¢

Teacher's Manual not available.

Unit, Final, Diagnostic tests not available.

Constructed Responses always used; no Multiple Choice and no Branching.

INTENDED POPULATION: "Anyone interested in an introduction to programed instruction."

Prerequisites: None

No Additional Material Required.

Time Required to Complete the program: 30 - 45 minutes (based solely on data.)

Student Data being used for revision.

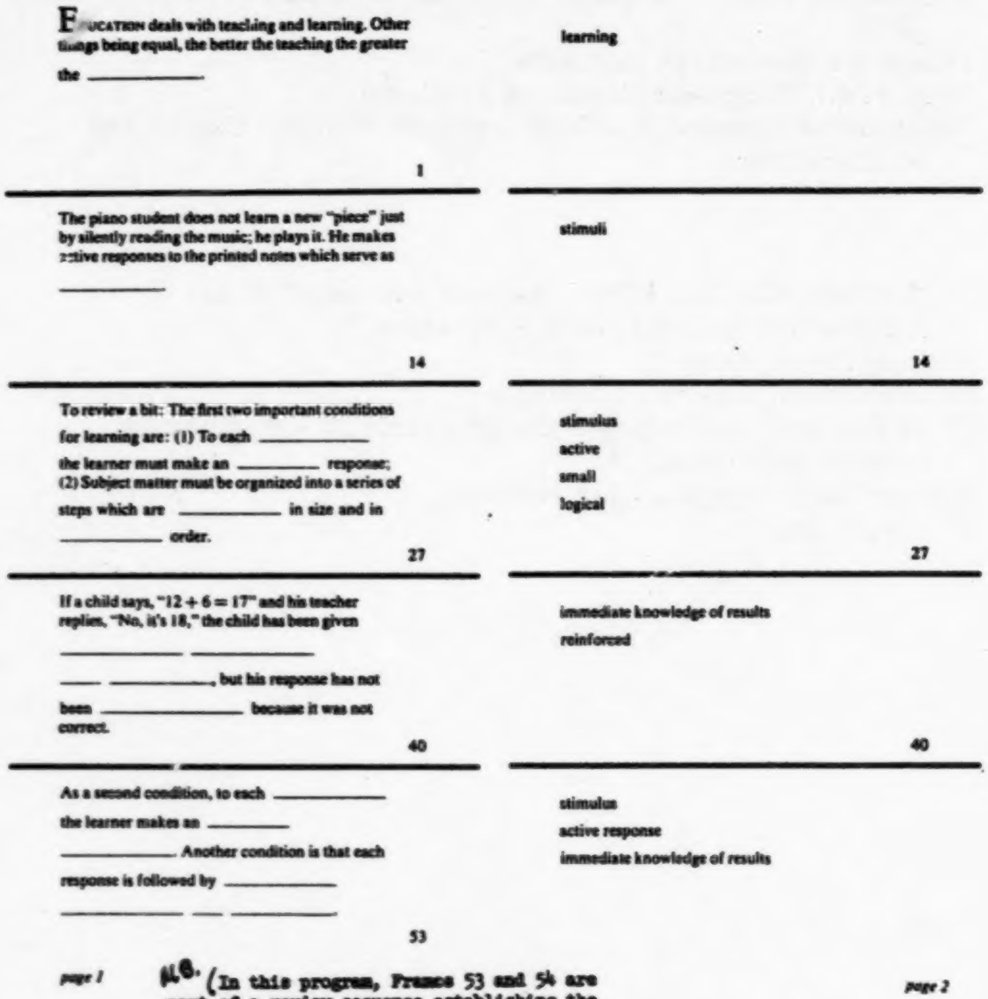
(1 sample page)

PROGRAMING

PROGRAMED INSTRUCTION: WHAT IT IS AND HOW IT WORKS

Milton, West; HARCOURT, BRACE AND WORLD
1 sample page:

From Programed Instruction: What It Is and How It Works by Ohmer Milton and Leonard J. West, © 1962 by Harcourt, Brace & World, Inc., and reprinted with their permission.



EDUCATION deals with teaching and learning. Other things being equal, the better the teaching the greater the ______ 1	learning
The piano student does not learn a new "piece" just by silently reading the music; he plays it. He makes active responses to the printed notes which serve as ______ 14	stimuli 14
To review a bit: The first two important conditions for learning are: (1) To each ______ the learner must make an ______ response; (2) Subject matter must be organized into a series of steps which are ______ in size and in ______ order. 27	stimulus active small logical 27
If a child says, "12 + 6 = 17" and his teacher replies, "No, it's 18," the child has been given ______ ______ ___ ______, but his response has not been ______ because it was not correct. 40	immediate knowledge of results reinforced 40
As a second condition, to each ______ the learner makes an ______ ______. Another condition is that each response is followed by ______ ______ ___ ______. 53	stimulus active response immediate knowledge of results

page 1 *page 2*

N.B. (In this program, Frames 53 and 54 are part of a review sequence establishing the fact that the program itself exemplifies the principles it has taught in the earlier frames.)

GENERAL SCIENCE

GENERAL SCIENCE PROGRAMMED LEARNING LABORATORY Junior High School

Matter in Motion, Flow of Energy, Structure of the Universe, Patterns of Life, Science at Work.

AIM STAFF, w/counsel of a board of educators and scientists.

Published by ACCELERATED INSTRUCTION METHODS
CORPORATION, 179 North Michigan Avenue,
Chicago 1, Illinois.

Programed text, 8500 frames, Paperback, 1920 pp., $ (?) .

Teacher's Manual available.

Daily Mastery Quizzes and Final tests available; not reusable.

Constructed Responses always used; no Multiple Choice; no Branching.

INTENDED POPULATION: "Junior High School general science students."

Prerequisites: "Junior High School reading ability."

Additional Material required: Student Research Guide (experiment manual) $ (?) .

Time Required to Complete program: one school year (Based solely on data).

Student Data being used for revision.

(8 sample pages)

GENERAL SCIENCE

GENERAL SCIENCE PROGRAMMED
LEARNING LABORATORY
AIM Staff; ACCELERATED INSTRUCTION METHODS
8 sample pages:

General Science

PROGRAMMED LEARNING LABORATORY

Volume 1 Matter in Motion
1 Motion
2 Force
3 Energy and Work
4 Simple Machines

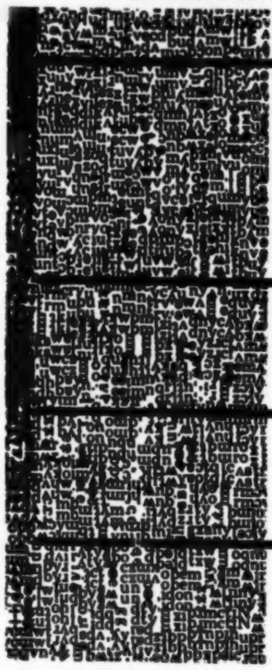
Volume 2 Flow of Energy
5 Sound
6 Heat
7 Light
8 Electricity and Magnetism

Volume 3 Structure of the Universe
9 Inside the Atom
10 Molecules
11 Earth
12 Universe

Volume 4 Patterns of Life
13 Units of Life
14 Chain of Life
15 Human Body
16 Behavior

Volume 5 Science at Work
17 Adaptation
18 Resources and Industry
19 Communication
20 Frontiers of Science

Earth



In this book you undertake the study of the ________.

2

We hear the expressions, "as solid as the Rock of Gibraltar," and "the everlasting hills" – which suggest that the earth's surface never changes.

But the earth's surface does change.

In fact, the earth's surface never stops *________.

* *ends in "–ing"*

3

The earth's surface is being constantly worn away in many places and raised higher in others.

The surface of the ________ is always changing.

4

Most changes are slow.

Some changes are sudden, but most are so ________ they would not be noticed in one lifetime.

5 The Rock of Gibraltar is being changed
as it is worn away every day by wind and water.

But it is being __________ so slowly that the change
would never be noticed even in a period of 50 years.

6 Although most changes are slow, others are relatively fast.

The edge of Niagara Falls changes as it is worn back
some 3 feet each year by the force of the water going over it.

The water of the Niagara River is causing the earth's __________
at the edge of the Falls to __________.

7 On November 7, 1957, a volcanic island, Nova, was pushed up
suddenly from the Atlantic Ocean near the Azores.

The eruption of the ocean floor was a violent change
in the surface of the __________.

8 GEOLOGY is the study of the earth.

A GEOLOGIST is a scientist who studies the earth
and the changes in the __________ of the __________.

9 When we study the earth and its changes
we are studying the science of * __________.

** ends in "—logy"*

10 The earth is very old.
It is believed to be from 3 billion to 6 billion years old.

This estimate of the earth's age is based partly on the work
of __________, scientists who study the earth and its changes.

11 We think of the pyramids of Egypt as being very ancient.
But compared to the age of the __________,
they are practically new

12

Today the earth teems with life –
plants, animals and 3 billion people.

Once the earth was a barren planet. At that time there were no people, no animals, nor any other form of ____________ on the earth.

13

The earth has been without life during most of its existence.

The appearance of ____________ on the earth is a comparatively recent event.

14

There have been living things on the earth for possibly 1 billion years.

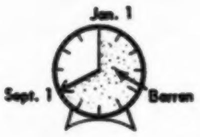
As great as this period of time is, it is only a fraction of the age of the ____________ .

15

Think of the earth's age this way:

Imagine shrinking the earth's whole history (3 to 6 billion years) into *one* year.

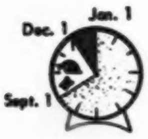
For the first 8 months of the year there is no ____________ on the earth.



16

Scientists think it is likely that during September, October, and November of our telescoped version of history, only primitive life-forms existed.

So life finally did appear on the earth, but for a long time the only forms of ____________ were primitive forms.

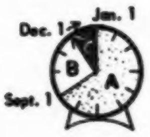


17

Not until December do more advanced forms of life appear.

In which portion appeared higher forms of life, such as birds and mammals?
* ____________

* *A, B, or C*



18 *Man* as we know him comes on the scene
only 15 minutes before midnight on
New Year's Eve!

And all recorded history takes place
in the last 60 seconds of the year.

__________ is one of the newest
kinds of life on the earth.

---

19 Is your grandfather as old as the hills? * __________

* *yes or no*

---

20 The earth is believed to be from 3 to 6 * __________ years old.

* *billion or million*

---

21 Over billions of years the surface of the earth has changed.
Also the living things that have inhabited the surface
for part of that time have __________.

---

22 The surface of the __________
and its living inhabitants are *still* * __________ .

* *ends in "—ing"*

---

23 The changes in the earth and its life have taken place
over a tremendously long period of __________ .

---

24 A geologist studies the earth and its changes.

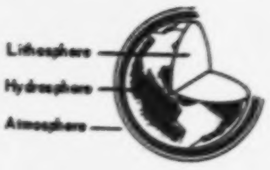
When you study the structure of the earth, the nature of its crust,
and the changes in its crust, you also will be studying
the science of __________.

Earth –(5)

25

Although the structure of the earth is very complicated, we can break it down into just three things: ATMOSPHERE, HYDROSPHERE, and LITHOSPHERE.

Three approximately round balls or spheres, one surrounding another, make up the basic structure of the ________ .



26

The three sections of the earth are not sharply separated from each other. They are not even perfectly round.

Yet they seem round enough to have been given names containing "sphere":

*__________, *__________, and *__________.

*begin with "atmo– ," "hydro– " and "litho–"

27

The *atmosphere* is the blanket, or sphere, of air surrounding the solid and liquid parts of the earth.

The outermost part of the earth is called the ________ .

28

The outside layer of the earth is a *________ called the ________ .

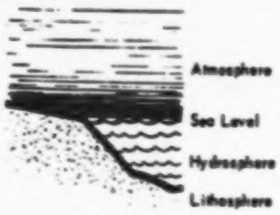
*solid, liquid, or gas

29

Almost all the molecules making up the atmosphere are concentrated within a layer a few miles deep at the bottom of the atmosphere.

Farther out, the molecules are few and far between.

Most of the earth's ________ is located relatively close to the surface of the land and water.



30 The atmosphere doesn't just lie motionless on top of us, it is forever on the move.

Wind and air currents are actually movements of the air, or the ______________ .

---

31 The *hydrosphere* is the part of the earth that is water.

Most of the earth's water is in the ocean.

The ocean, which covers nearly $\frac{3}{4}$ of the earth's surface, contains most of the water which makes up the ______________________.

---

32 Also, water present in the ground and in the air is part of the hydrosphere.

The hydrosphere consists of all the __________ in the earth.

---

33 Ice is frozen water. So ice belongs to the hydrosphere.

The Greenland icecap *_____ a part of the hydrosphere.

** is ... is not*

---

34 The ocean is never without waves and currents.

Like the atmosphere, the *___________ is always moving.

** ends in "—sphere"*

---

35 The two layers surrounding the main body of the earth are the *____________ and the *_____________

** means air* ** means water*

---

36 The *lithosphere* is the main body of the earth.

Litho means stone. *Sphere* means ball.

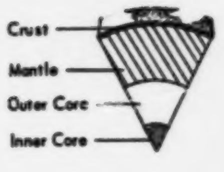
The "stone ball" which we usually think of as the "solid earth" is called the ____________ .

54

The core is very hot, probably over 1,000°C at its center.

Scientists believe that the outer part of the core is a liquid mass of iron and nickel and that its center is solid.

Scientists think the inner core is solid, but the outer __________ is liquid.

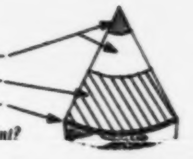


55

The lithosphere consists of:

1. ____________________
2. ____________________
3. ____________________

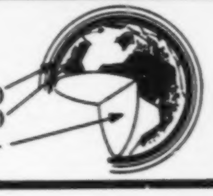
Careful! Where do the arrows point?



56

Name the three "spheres" that make up the entire earth:

1. ____________________ (air)
2. ____________________ (water)
3. ____________________

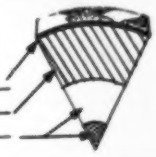


CHAPTER 2

57

What are the three layers that make up the lithosphere?

1. ____________________
2. ____________________
3. ____________________



58

People are likely to be most curious about the layer of the lithosphere that they live closest to – the crust.

This is the layer we will study now.

We will study the __________ of the earth – what it is made of and how it is changed.

59

Elements are the basic substances of which all matter is composed.

There are over 100 elements.

Ninety of these __________ are stable enough to occur naturally in the earth's crust.

147 Sphalerite, the most important zinc-containing mineral, has these distinguishing features:

It is yellowish-white when powdered;
it can scratch calcite but not fluorite;
it breaks along six different planes.

What three physical properties are involved here:

____________, ____________ and ____________

---

148 A mineral is an ____________ or a ____________ that occurs naturally without the help of organic processes and has a fixed chemical composition.

---

149 A ROCK is a mineral or a mixture of minerals that forms a part of the earth's crust.

When a mineral, such as quartz, occurs *by itself* in the earth's crust, it is then a __________

---

150 Look again at the definition in frame 149.

When a mineral, such as quartz, occurs in the earth's crust *in a mixture* with other minerals, the whole mixture of minerals is a __________

---

151 "Rock-hounds" are not dogs, but people who like to hunt for interesting pieces of the earth's ____________.

---

152 Basically, the earth's crust is made up of elements.

One or more ____________ make a mineral;
one or more ____________ make a rock;
and many kinds of ____________ make up the earth's crust.

---

153 The Pilgrims alighting on Plymouth Rock probably gave little thought to the fact that they were stepping onto a mixture of ____________.

GENERAL SCIENCE

MEASUREMENT OF SPACE, TIME AND MATTER Jr. H.S.
Introduction to General Science
(Phy., Chem. & Bio.)
MARSHALL A. ARKY, Director of Systems, and
STEPHEN LeJ. MAXWELL, Director of Programming,
ROTO-VUE.
Published by ROTO-VUE (MODEL PUB. CO.),
211 North 7th Street, 1212 Holland Bldg.,
St. Louis 1, Mo.

Programed text, 1069 frames, Paperback, 5" X 8", 98 pp., $20.00 (Available in machine format by special order)
Answer sheets available @ 62¢.
Teacher's Manual: included in program.
Unit tests available @ 10¢; Final and Diagnostic tests available @ 35¢; reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "Grades 7 to 12"
Prerequisites: "Arithmetic: 6th grade"
Additional Material required: "Response-Answer Sheets"
Time Required to Complete program: 9.5 hours (2 weeks) (Grade 10 Average)
Student Data being used for revision.
(one sample page)

GENERAL SCIENCE

MEASUREMENT OF SPACE, TIME AND MATTER

Arky, Maxwell; ROTO-VUE
one sample page:

SAMPLE PROGRAM METRIC MEASUREMENT (JSMMI-exp)

1. When you choose something by chance the thing you choose is an arbitrary choice. When you draw straws you probably have no special reason for the straw you pick, it is an arbitrary choice. The numbers in a bingo game are selected by chance.
Each of these numbers is an __________ choice.

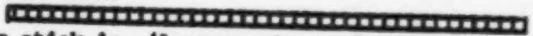
4. Any units of measurement are purely arbitrary. One can base a system of measurement on almost any standard you can think of. This line: A________B, has no special length and we could call it anything. Let's call it a gob. This line, A________B is a ____.

19. The meter is the basic unit or standard, of the metric system. The meter is the standard of the _______ _______.

24. The standard of the metric system is the meter. The scientific system of measurement is the metric system. The standard of the scientific system of measurement is the ______.

40. The meter does not represent any particular distance so it is an arbitrary unit. The length that was chosen to be the meter was chosen arbitrarily, and even that length was not the distance it was thought to represent (one ten-millionth of the distance from the North Pole to the Equator). The meter is an __________ unit.

47. The meter can be represented on a meter stick that is slightly longer, 3.37 inches longer, than a yardstick. If we draw a yardstick like this: then a meter stick looks about like this:



A meter stick is (longer, shorter) ______ than the yardstick.

50. One hundred CENTimeters make a meter. This is similar to the system we use with money: one hundred CENTS make a dollar.
100 centimeters = 1 ____

51. 100 centimeters equal 1 meter as 3 feet equal 1 yard. 200 centimeters equal 2 meters as 6 feet equal 2 yards. It takes 9 feet to make 3 yards.
The number of centimeters it takes to make 3 meters is ____.

74. The abbreviation for meter is m. For example: 15 meters can be written as 15 m.

86. The metric system is very easy to use because it is easy to remember units that are only multiples of 10, or divisions of 10. For example:
10 millimeters (mm) equals 1 centimeter (cm)
10 centimeters (cm) equals 100 millimeters (mm)
1 cm equals ___ mm

GENERAL SCIENCE

MEASURING LENGTH WITH METRIC AND ENGLISH UNITS Elementary

DAVID BELASH, SETH WOHL, LEWIS D. EIGEN, BERTRAM M. SIEGEL, The Center for Programed Instruction, New York City.
Published by SCIENCE RESEARCH ASSOCIATES, Inc.,
259 East Erie Street, Chicago 11, Illinois.

Programed text, 650 frames, Paperback, 7" X 9", 200 pp., $2.50.
Answer sheets available @ 39¢.
Teacher's Manual available; free with class orders, 50¢ if ordered separately.
Final test available; free with answer booklet; 10¢ if ordered separately, not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "Grades 4-6."
Prerequisites: "Elementary knowledge of addition and fractions, 4th grade reading level."
Additional Equipment required: "two rulers (12 1/4 inches and 30 1/2 cm.), one measuring tape (39.37 inches on one side, 1 meter on the other), 9 blocks of varying sizes and shapes. All materials are color-coded. Total: $5.00."
Time Required to Complete program: 11 hours (based partly on data.)
Student Data being used for revision.
(one sample page)

GENERAL SCIENCE

MEASURING LENGTH WITH METRIC AND ENGLISH UNITS

Belash, Wohl, Eigen, Siegel; SCIENCE RESEARCH ASSOCIATES
one sample page:

113.

Each of these lines is very close together.
Each of these lines stands for a very small
☐.

Each of these units is called a MILLIMETER.
Since there are 10 of these small lines or
units called ☐ in every centimeter,
there are 10 ☐ in every centimeter.

5/10 centimeter = 1/2 centimeter = ☐ millimeters.

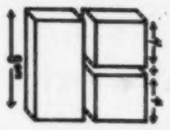
238.

20 centimeters is how far it is
around the four lines of square a.

20 centimeters is therefore called
the ☐ ----meter of square a.

341.

It is easier for you to see that the orange block
is twice as high as it is wide, if you place two
blue blocks alongside the orange block in the way the
picture shows you.



(Remember that the blue block is as
high as the orange block is wide.)

(*How many?*) ☐ blue blocks placed
on top of each other are as high
as one orange block.

393.

When we add the lengths of lines 8 and 9 together,
using the plus sign and the equals sign, we can
write:

5 centimeters ☐ 5 centimeters ☐
10 centimeters.

GENERAL SCIENCE

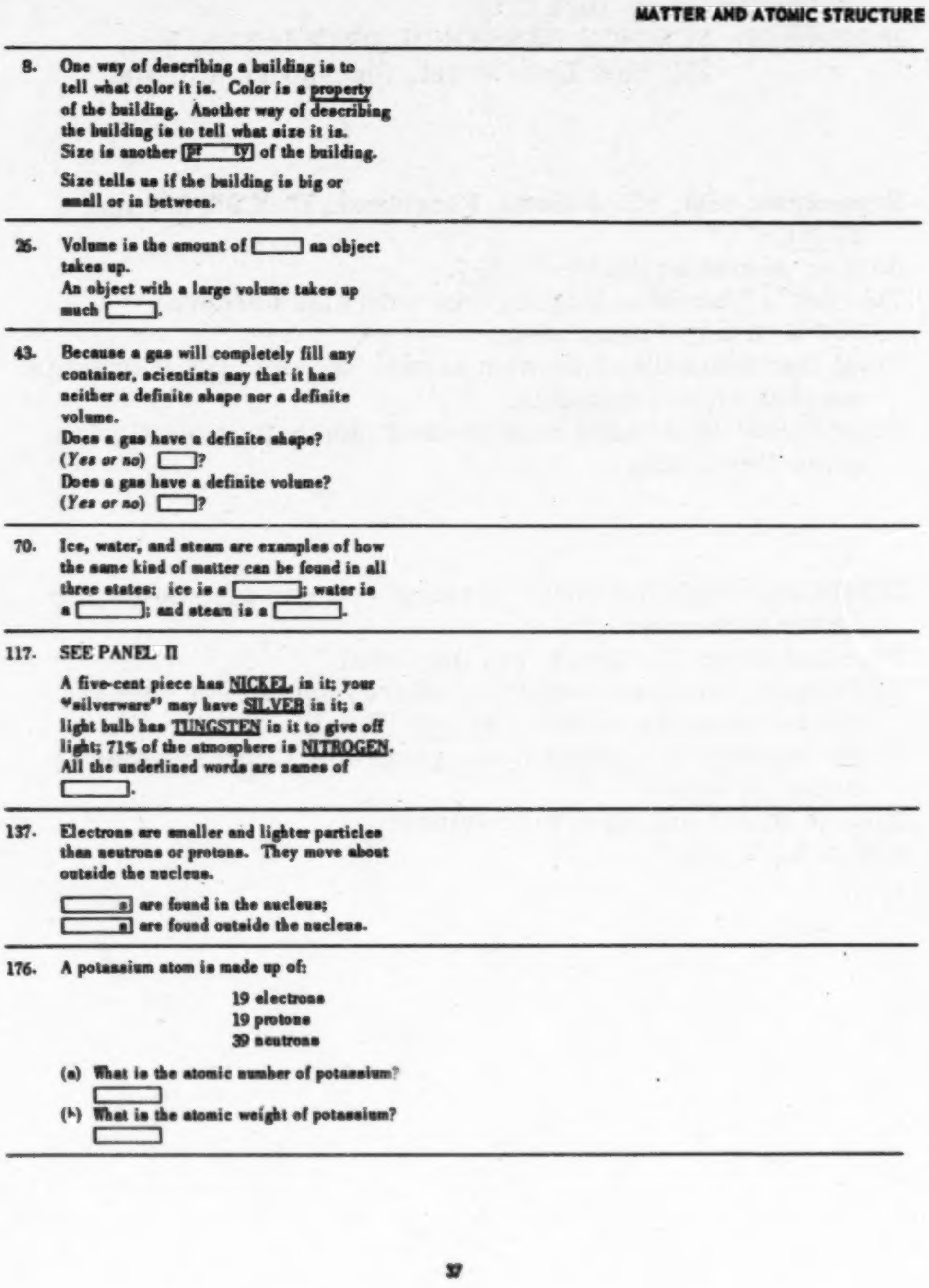
MATTER AND ATOMIC STRUCTURE Elementary
BERTRAM M. SIEGEL, DAVID BELASH,
LEWIS D. EIGEN, SETH WOHL, Programers,
The Center for Programed Instruction, Inc.
New York City.
Published by SCIENCE RESEARCH ASSOCIATES, Inc.
259 East Erie Street, Chicago 11, Illinois.

Programed text, 285 frames, Paperback, 7" X 9", 40 pp., $1.00.
Answer sheets available @ .39¢.
Teacher's Manual available; free with class orders, .50¢ if ordered separately.
Final test available; free with class orders, .10¢ if ordered separately, not reusable.
Constructed Responses usually used; Multiple Choice and Branching sometimes used.

INTENDED POPULATION: "Grades 4-6."
Prerequisites: "4th grade reading level."
No Additional Equipment required.
Time Required to Complete program: 3 hours (based partly on data.)
Student Data being used for revision.
(one sample page)

GENERAL SCIENCE

MATTER AND ATOMIC STRUCTURE
Siegel, Belash, Eigen, Wohl; SCIENCE RESEARCH ASSOCIATES
one sample page:



MATTER AND ATOMIC STRUCTURE

---

8. One way of describing a building is to tell what color it is. Color is a property of the building. Another way of describing the building is to tell what size it is. Size is another [pr ty] of the building.

Size tells us if the building is big or small or in between.

---

26. Volume is the amount of ☐ an object takes up.
An object with a large volume takes up much ☐.

---

43. Because a gas will completely fill any container, scientists say that it has neither a definite shape nor a definite volume.
Does a gas have a definite shape?
(*Yes or no*) ☐?
Does a gas have a definite volume?
(*Yes or no*) ☐?

---

70. Ice, water, and steam are examples of how the same kind of matter can be found in all three states: ice is a ☐; water is a ☐; and steam is a ☐.

---

117. SEE PANEL II

A five-cent piece has NICKEL in it; your "silverware" may have SILVER in it; a light bulb has TUNGSTEN in it to give off light; 71% of the atmosphere is NITROGEN. All the underlined words are names of ☐.

---

137. Electrons are smaller and lighter particles than neutrons or protons. They move about outside the nucleus.

☐s are found in the nucleus;
☐s are found outside the nucleus.

---

176. A potassium atom is made up of:

19 electrons
19 protons
39 neutrons

(a) What is the atomic number of potassium?
☐
(b) What is the atomic weight of potassium?
☐

37

GENERAL SCIENCE

DISCOVERING A TINY WORLD THROUGH THE MICROSCOPE Elem. - Jr. H.S.
SETH WOHL, LEWIS D. EIGEN, DAVID BELASH,
BERTRAM M. SIEGEL, The Center for Programed Instruction, New York City.
Published by SCIENCE RESEARCH ASSOCIATES, Inc.,
259 East Erie Street, Chicago 11, Illinois

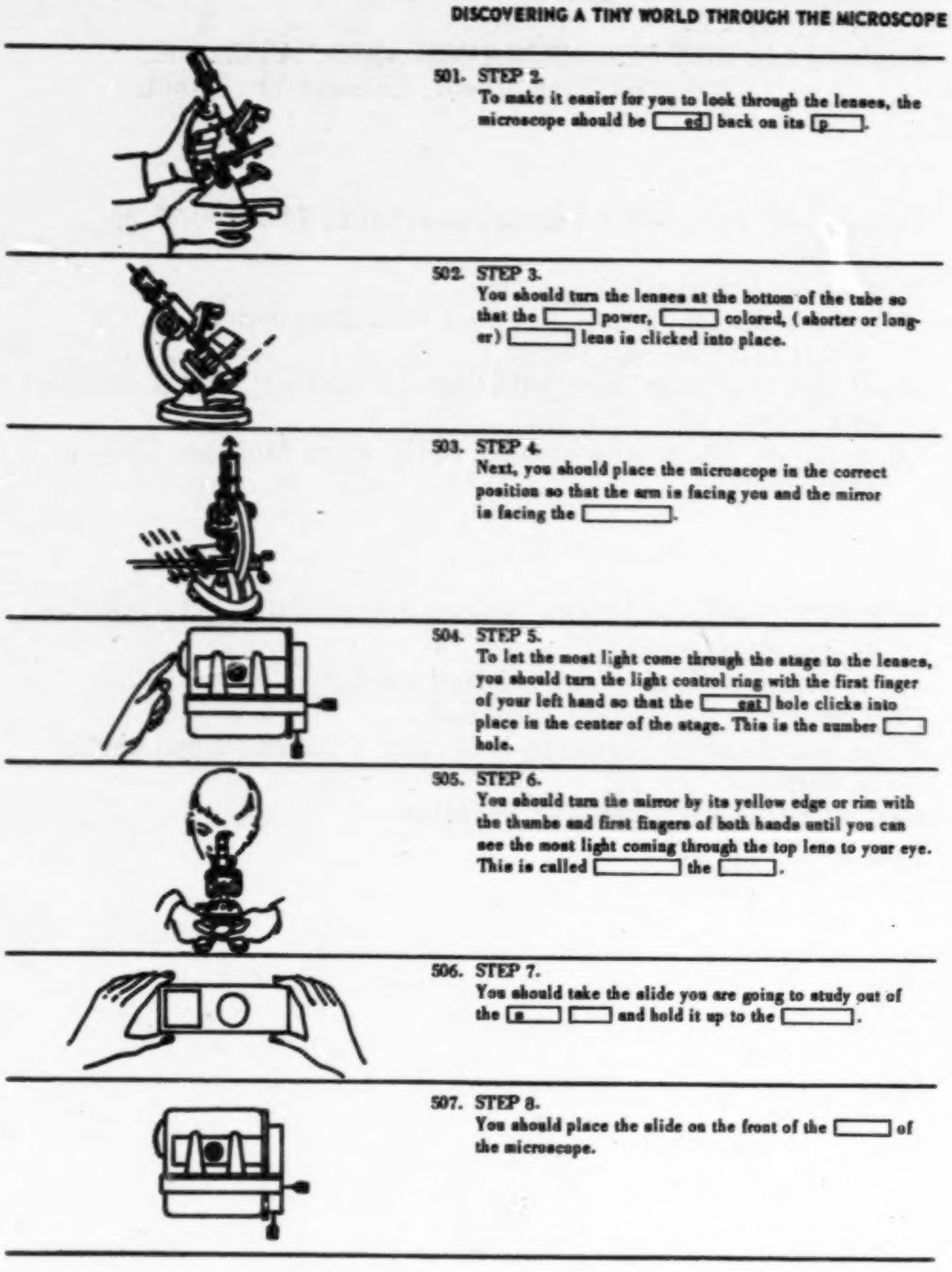
Programed text, 625 frames, Paperback, 7" X 9", 200 pp., $2.50.
Answer sheets available @ .39¢.
Teacher's Manual available; free with class orders; 50¢ if ordered separately.
Final test available; free with answer booklet; 10¢ if ordered separately, not reusable.
Constructed Responses usually used; some Multiple Choice; some Branching.

INTENDED POPULATION: "Grades 4-6; can also be used in junior high school."
Prerequisites: "5th grade reading level."
Additional Equipment required: Microscope (color coded), and Set of seven slides - $45.00 (Total).
Time Required to Complete the program: 12 hours (based partly on data.)
Student Data being used for revision.
(one sample page)

GENERAL SCIENCE

DISCOVERING A TINY WORLD THROUGH THE MICROSCOPE

Wohl, Eigen, Belash, Siegel; SCIENCE RESEARCH ASSOCIATES
one sample page:



DISCOVERING A TINY WORLD THROUGH THE MICROSCOPE

501. STEP 2.
To make it easier for you to look through the lenses, the microscope should be [ed] back on its [p].

502. STEP 3.
You should turn the lenses at the bottom of the tube so that the ☐ power, ☐ colored, (shorter or longer) ☐ lens is clicked into place.

503. STEP 4.
Next, you should place the microscope in the correct position so that the arm is facing you and the mirror is facing the ☐.

504. STEP 5.
To let the most light come through the stage to the lenses, you should turn the light control ring with the first finger of your left hand so that the [est] hole clicks into place in the center of the stage. This is the number ☐ hole.

505. STEP 6.
You should turn the mirror by its yellow edge or rim with the thumbs and first fingers of both hands until you can see the most light coming through the top lens to your eye. This is called ☐ the ☐.

506. STEP 7.
You should take the slide you are going to study out of the [s] ☐ and hold it up to the ☐.

507. STEP 8.
You should place the slide on the front of the ☐ of the microscope.

32

GENERAL SCIENCE

HOW SCIENTISTS PUT ANIMALS INTO GROUPS Elementary - Jr. H.S.
SETH WOHL, LEWIS D. EIGEN,
DAVID BELASH, BERTRAM M. SIEGEL,
The Center for Programed Instruction,
New York City
Published by SCIENCE RESEARCH ASSOCIATES, Inc.,
259 East Erie Street, Chicago 11, Illinois.

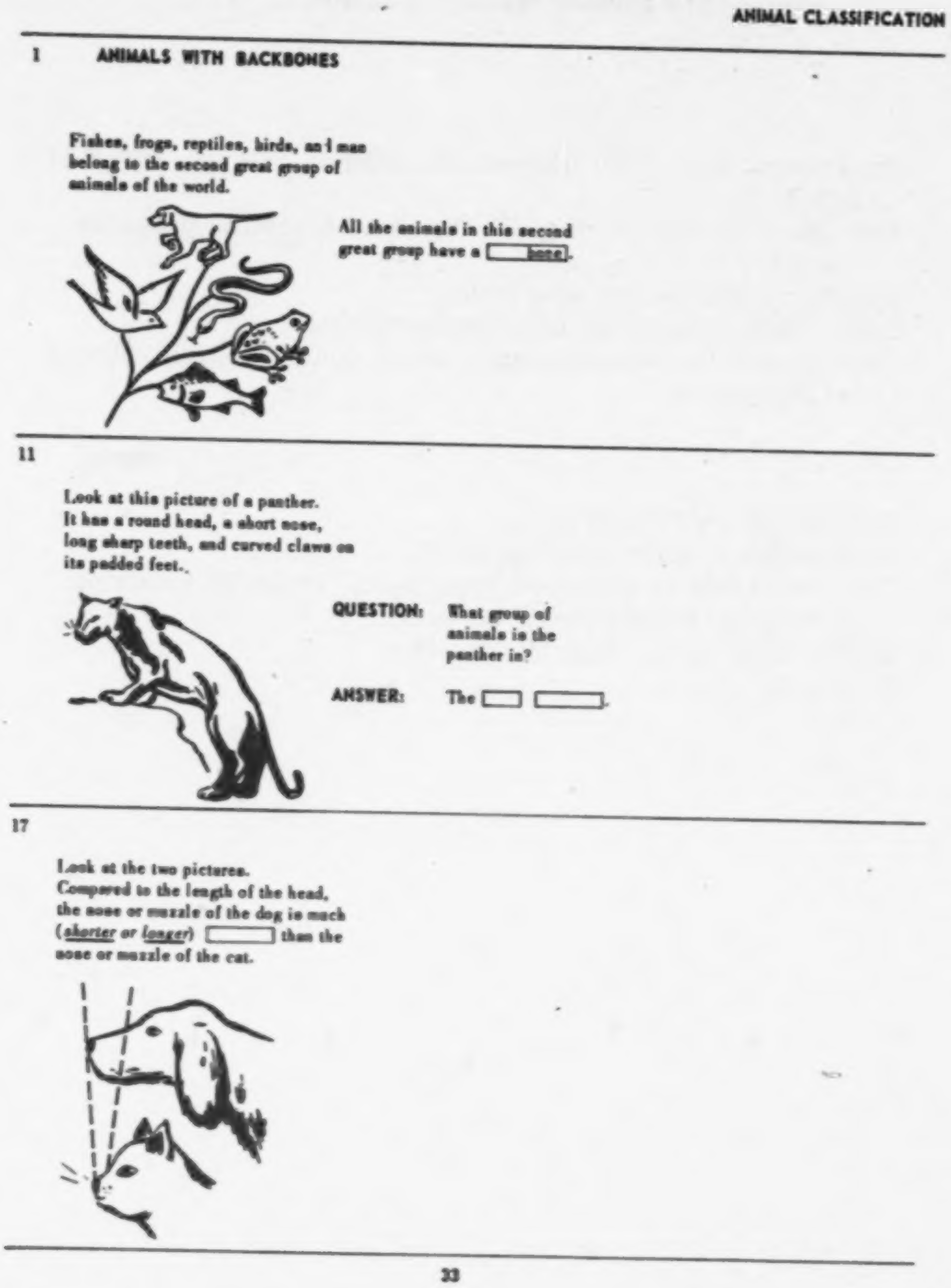
Programed text, 500 frames, Paperback, 7" X 9", 75 pp., $2.25.
Answer sheets available @ .39¢.
Teacher's Manual available; free with class orders, .50¢ if ordered separately.
Final test available; free with answer booklet; .10¢ if ordered separately, not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "Grades 4-6; can also be used in Junior High School."
Prerequisites: "5th grade reading level."
No Additional Equipment required.
Time Required to Complete program: 7 hours (based partly on data.)
Student Data being used for revision.
(one sample page)

GENERAL SCIENCE

HOW SCIENTISTS PUT ANIMALS INTO GROUPS

Wohl, Eigen, Belash, Siegel; SCIENCE RESEARCH ASSOCIATES
one sample page:



ANIMAL CLASSIFICATION

1 **ANIMALS WITH BACKBONES**

Fishes, frogs, reptiles, birds, and man belong to the second great group of animals of the world.

All the animals in this second great group have a ☐ bone.

11

Look at this picture of a panther. It has a round head, a short nose, long sharp teeth, and curved claws on its padded feet.

QUESTION: What group of animals is the panther in?

ANSWER: The ☐ ☐.

17

Look at the two pictures. Compared to the length of the head, the nose or muzzle of the dog is much (*shorter* or *longer*) ☐ than the nose or muzzle of the cat.

33

GENERAL SCIENCE

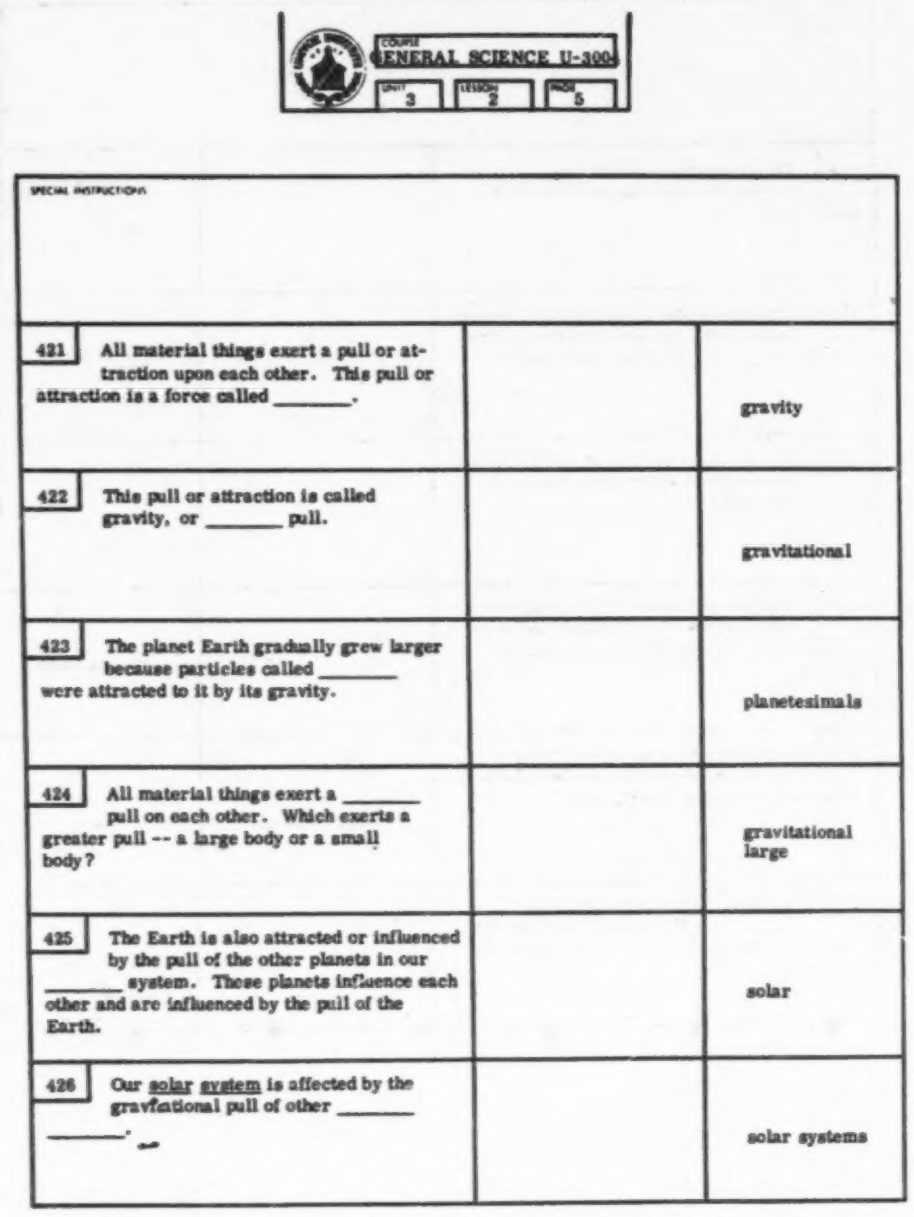
GENERAL SCIENCE U-3004
UNIVOX INSTITUTE, INC.
Published by UNIVERSAL ELECTRONICS
LABORATORIES CORPORATION,
510 Hudson Street, Hackensack, N. J.

Programed text, 2160 frames, Paperback, 360 pp., 8½" X 11", $14.95.
For use in Univox Model "U" Teaching Machine; program reusable.
Teacher's Manual not available.
Unit, Final, Diagnostic tests not available.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION:
No Additional Materials Required.
Time Required to Complete program: "From 30 hours to 36 hours" (based partly on data).
Student Data being used for revision.
(2 sample pages)

GENERAL SCIENCE

GENERAL SCIENCE U-3004
Univox Institute, Inc.; UNIVERSAL ELECTRONICS LABORATORIES
2 sample pages:



COURSE
GENERAL SCIENCE U-3004
UNIT 3 | LESSON 2 | PAGE 5

SPECIAL INSTRUCTIONS

421 All material things exert a pull or attraction upon each other. This pull or attraction is a force called _______.		gravity
422 This pull or attraction is called gravity, or _______ pull.		gravitational
423 The planet Earth gradually grew larger because particles called _______ were attracted to it by its gravity.		planetesimals
424 All material things exert a _______ pull on each other. Which exerts a greater pull -- a large body or a small body?		gravitational large
425 The Earth is also attracted or influenced by the pull of the other planets in our _______ system. These planets influence each other and are influenced by the pull of the Earth.		solar
426 Our solar system is affected by the gravitational pull of other _______ _______.		solar systems

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COURSE
GENERAL SCIENCE U-200

UNIT 3 LESSON 4 PAGE 2

SPECIAL INSTRUCTIONS

475 The gravitational pull of the _______ is only one-sixth that of the earth's pull.		moon
476 This means that if you weigh 120 pounds on the Earth you would weigh one-sixth of that, or _______ pounds on the moon.		20
477 If you jumped two feet on the Earth, the same energy would carry you _______ feet on the moon.		12
478 The pull or force which is being compared between the Earth and the moon is called the _______ pull, or the pull of gravity.		gravitational
479 When we look at the moon through a telescope, the surface of the moon is magnified and can be clearly seen.	GO TO NEXT FRAME	
480 Looking at the moon through a _______, which magnifies it, we can see rough and smooth areas on the surface of the moon.		telescope

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SCIENCE - BIOLOGY

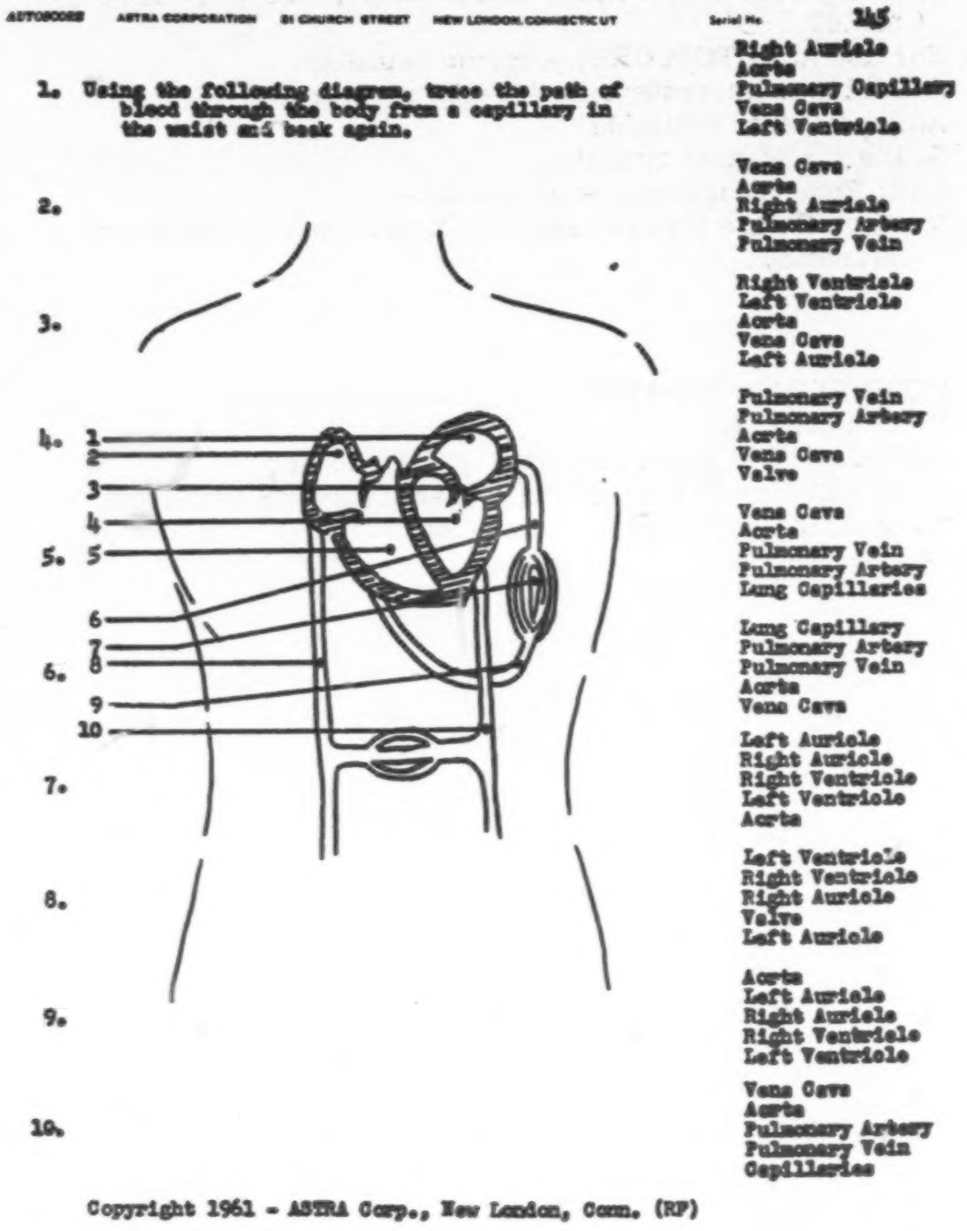
HUMAN ANATOMY AND PHYSIOLOGY
ASTRA PROGRAMMING STAFF
Published by ASTRA CORPORATION,
31 Church Street, New London, Conn.

Pack of cards (840 frames) in Cardboard boxes, $8\frac{1}{2}$" X 11", $20.00.
For use in AUTOSCORE; program reusable.
Available in separate units @ $4.00 per section.
Answer sheets available.
Teacher's Manual available.
Unit, Final, Diagnostic tests available.
Multiple Choice always used; no Constructed Responses or Branching.

INTENDED POPULATION:
Prerequisites:
Additional Equipment required: AUTOSCORE.
Time Required to Complete Program: (no data available)
Student Data being used for revision.
(one sample page)

SCIENCE - BIOLOGY

HUMAN ANATOMY AND PHYSIOLOGY
Astra Programming Staff; ASTRA
one sample page:


1
2
3
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10

AUTOSCORE ASTRA CORPORATION 21 CHURCH STREET NEW LONDON, CONNECTICUT Serial No. 145

1. Using the following diagram, trace the path of blood through the body from a capillary in the waist and back again.	Right Auricle Aorta Pulmonary Capillary Vena Cava Left Ventricle
2.	Vena Cava Aorta Right Auricle Pulmonary Artery Pulmonary Vein
3.	Right Ventricle Left Ventricle Aorta Vena Cava Left Auricle
4.	Pulmonary Vein Pulmonary Artery Aorta Vena Cava Valve
5.	Vena Cava Aorta Pulmonary Vein Pulmonary Artery Lung Capillaries
6.	Lung Capillary Pulmonary Artery Pulmonary Vein Aorta Vena Cava
7.	Left Auricle Right Auricle Right Ventricle Left Ventricle Aorta
8.	Left Ventricle Right Ventricle Right Auricle Valve Left Auricle
9.	Aorta Left Auricle Right Auricle Right Ventricle Left Ventricle
10.	Vena Cava Aorta Pulmonary Artery Pulmonary Vein Capillaries

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SCIENCE - BIOLOGY

MUSCLES, NERVES, and BONES of the HEAD
Published by EDUCATION ENGINEERING, Inc.,
3810 Pacific Coast Highway, Torrance, Calif.

5400 frames for use in "SPEED" machine, $50; program reusable.
Programed text, Paperback, 180 pages, 5" X 7",
5 separate units @ $3.75 each.
Teacher's Manual available @ $4.00.
Unit, Final, Diagnostic tests available at $3.75 each; tests reusable.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

INTENDED POPULATION:
Student Prerequisites:
Additional Equipment required: "SPEED" teaching machine, $700 & $850.
Time Required to Complete program: 11 hours (based partly on data).
Student Data being used for revision.
(three sample pages)

SCIENCE - BIOLOGY

MUSCLES, NERVES, and BONES of the HEAD
EDUCATION ENGINEERING
three sample pages:

DIRECTION OF PRESSURE IN MASSAGING MUSCLES

As a general rule, when massaging muscles, manipulate from insertion to origin (upward). A few exceptions exist for muscles that have more fixed attachments with sufficient flexibility to permit massaging over, crosswise or towards origins without irritation.

Light massaging, such as spreading lotions, creams, and powders, can be done without respect to direction.

The reasons for massaging from insertion to origin (upward) are:

1. To massage in harmony with muscles and the flow of blood.
2. To prevent irritation.
3. To facilitate contraction (a muscle responds more readily when exercised from its more movable attachment (insertion) to its less movable attachment (origin).

ABC01 - S11

The ____ is the ____ movable attachment and the ____ is the ____ movable attachment.
(1) origin, less, insertion, more
(2) insertion, less, origin, more
(3) none of these

The ____ of nearly all face muscles extend ____ from their ____.
(7) origins, downward, insertions
(8) insertions, downward, origins
(9) insertions, upward, origins
(10) none of these

As a general rule, when massaging muscles, manipulate from ____ to ____ which is in the ____ direction.
(4) insertion, origin, upward
(5) origin, insertion, downward
(6) insertion, origin, downward
(7) origin, insertion, upward

4. A few exceptions exist for muscles that have more ____ attachment with sufficient ____ to permit massaging in other directions without irritation.
(7) fixed, flexibility
(8) fixed, rigidity
(9) flexible, flexibility
(10) none of these

5. One of the reasons for establishing a definite direction of massaging is:
(7) To massage in opposition to the flow of blood.
(8) To prevent contraction.
(9) To cause irritation.
(10) To massage in harmony with muscles and the flow of blood.

ABC01 - Q11

COMPOSITION OF MUSCLES AND THEIR NOURISHMENT

Muscles are composed of reddish fibres which form the red flesh of the body and they are similar to lean meat. They are well supplied with blood vessels, lymphatics, and nerves. In other words muscles are composed of bundles of muscle fibres wrapped together.

Muscles are nourished by food elements delivered to muscle cells by small blood and lymph vessels located in the connective tissue of the muscle.

Each muscle contains blood vessels and lymphatics from which it receives nourishment.

Insertions of nearly all face muscles extend downward from their origin.

ABC01 - 812

1. Where should light pressure be applied in massaging?
   (7) d, i, k, m (9) h, i, k, m
   (8) d, h, i, m (10) none of these

2. Where should firm pressure be applied in massaging?
   (1) b, f, h, i (3) b, f, h, j
   (2) b, f, i, j (4) none of these

3. Most muscles of the face should be massaged from ____ to ____ or ____
   (4) n, a, e (6) n, a, l
   (5) a, n, e (7) a, n, l

4. A few muscles that have more ____ attachments with sufficient ____ do not have to be massaged in the direction described in question 3.
   (5) o, p (7) s, r
   (6) q, r (8) none of these

5. The ____ is the ____ movable and the ____ the ____ movable attachment.
   (7) g, c, h, g (9) n, c, a, g
   (8) h, c, j, g (10) none of these

---

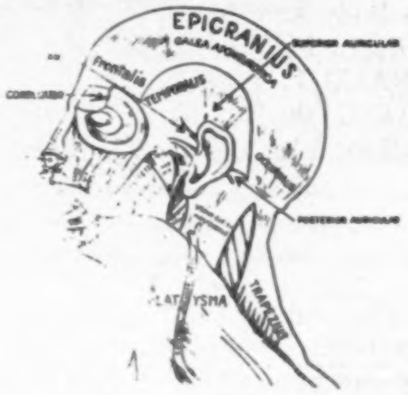
a. origin
b. scalp
c. less
d. around Adam's apple
e. upward
f. sides of back of neck
g. more
h. cheek
i. around chin
j. nose
k. along mandible
l. downward
m. around eye
n. insertion
o. fixed
p. flexibility
q. rigid
r. rigidity
s. flexible

ORIGINS AND INSERTIONS OF THREE MUSCLES

ZYGOMATICUS - takes its origin from the zygomatic bone and has its insertion at angle of mouth.

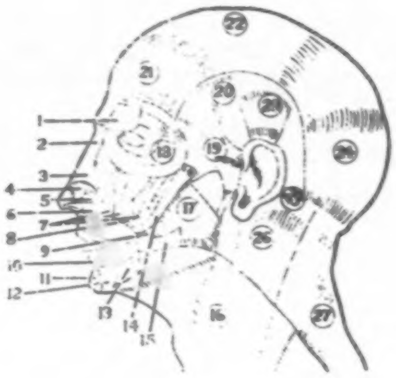
MASSETER - takes its origin from the zygomatic bone and has its insertion in the mandible.

TEMPORALIS - takes its origin from the temporal bone and has its insertion in the mandible.



ABC01 - S15

1. Identify the zygomaticus muscle.
   - (3) 17
   - (4) 20
   - (5) 14
   - (6) 7
2. Identify the masseter muscle.
   - (1) 20
   - (2) 19
   - (3) 14
   - (4) 17
3. Identify the temporalis muscle.
   - (1) 19
   - (2) 23
   - (3) 20
   - (4) 17
4. Name two muscles that take their origin from the zygomatic bone.
   - (7) zygomaticus, temporalis
   - (8) none of these
   - (9) masseter, temporalis
   - (10) masseter, zygomaticus
5. Name two muscles that have their insertions in the mandible.
   - (7) masseter, temporalis
   - (8) zygomaticus, masseter
   - (9) zygomaticus, temporalis
   - (10) none of these



ABC01 - Q15

SCIENCE - BIOLOGY

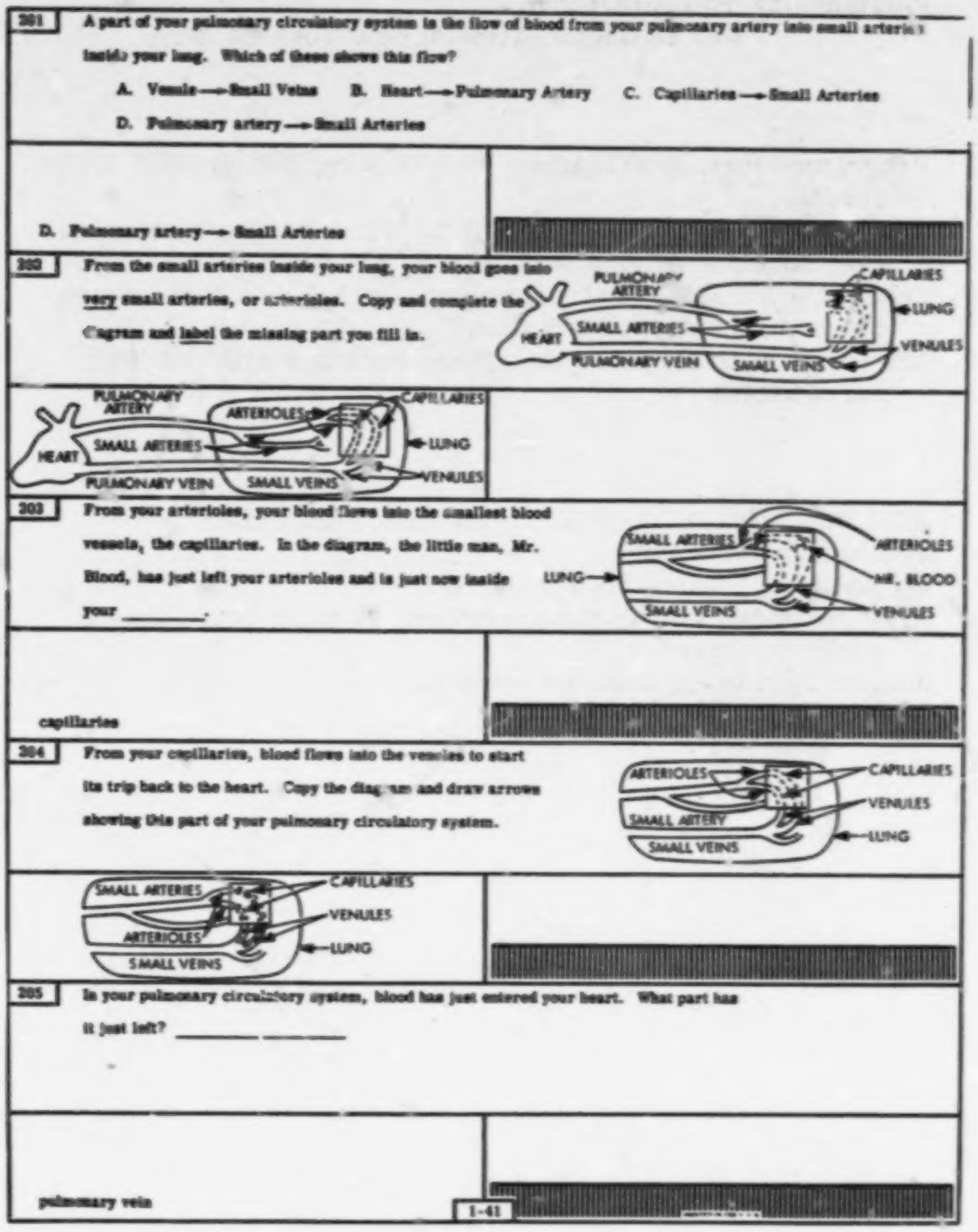
BASIC SCIENCE SERIES: High School
FUNDAMENTALS OF HUMAN PHYSIOLOGY
The Body and How it Works
JOHN P. FULLILOVE,
DONALD T. TOSTI,
POLO C. de BACA, Programers, TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 1800 frames, Vinyl cover, 398 pp., 8½" X 11", $10.00.
For use in Min/Max, Min/Max II machine; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
"No tests available other than those enclosed with course"; not reusable.

INTENDED POPULATION: "High School students."
Prerequisites: None.
No Additional Materials required.
Time Required to Complete program: 20 to 30 hours (based solely on data).
Student Data being used for revision.
(2 sample pages)

SCIENCE - BIOLOGY

BASIC SCIENCE SERIES:
FUNDAMENTALS OF HUMAN PHYSIOLOGY
Fullilove, Tosti, de Baca; TMI-GROLIER
2 sample pages:


PULMONARY ARTERY
CAPILLARIES
LUNG
SMALL ARTERIES
HEART
VENULES
PULMONARY VEIN
SMALL VEINS
ARTERIOLES
MR. BLOOD
SMALL ARTERY

301 A part of your pulmonary circulatory system is the flow of blood from your pulmonary artery into small arteries inside your lung. Which of these shows this flow?

A. Venule → Small Veins B. Heart → Pulmonary Artery C. Capillaries → Small Arteries
D. Pulmonary artery → Small Arteries

D. Pulmonary artery → Small Arteries

302 From the small arteries inside your lung, your blood goes into very small arteries, or arterioles. Copy and complete the diagram and label the missing part you fill in.

303 From your arterioles, your blood flows into the smallest blood vessels, the capillaries. In the diagram, the little man, Mr. Blood, has just left your arterioles and is just now inside your ________.

capillaries

304 From your capillaries, blood flows into the venules to start its trip back to the heart. Copy the diagram and draw arrows showing this part of your pulmonary circulatory system.

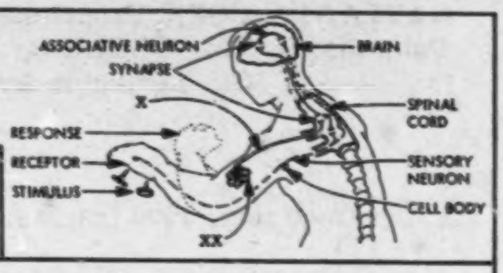
305 In your pulmonary circulatory system, blood has just entered your heart. What part has it just left? ________ ________

pulmonary vein

1-41

6

186 Name the X and the XX parts of the diagram.



XX Effectors X Motor Neurons

187 Meat and eggs are foods which are high in ________

protein

188 When a sensory impulse leaves a sensory neuron and goes to an associative neuron, there is a ________ between the sensory and associative neurons.

synapse

189 Voluntary muscles are made up of many tiny fibres called ________.

fibrils

190 What is the function of hyaline cartilage? ____________

to protect or cushion movable joints

6-38

SCIENCE - CHEMISTRY

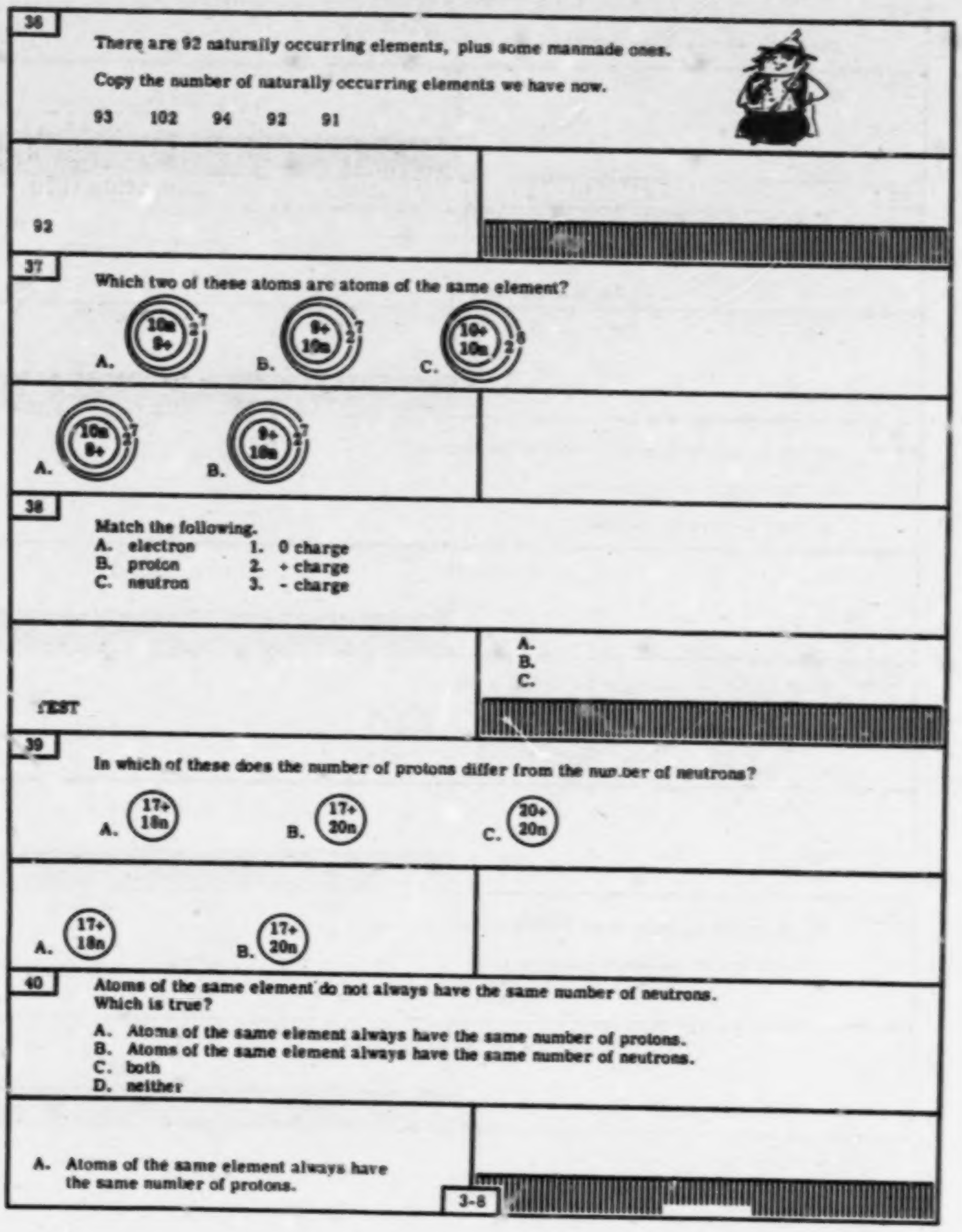
BASIC SCIENCE SERIES: CHEMISTRY Junior High School
Matter and Chemical Change
BARBARA BOWMAN,
GAYLA GLASCOCK, Programers, TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N. Y.

Programed text, 3000 frames, Vinyl cover, 600 pp., 8½" X 11", $ (?) .
For use in Min/Max, Min/Max II machines; programs reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
"No tests available other than those enclosed with course"; not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "Program has been taught successfully to 6th grade students. It is recommended for Junior High level or as a basic introduction to Chemistry at any age level."
Prerequisites:
No Additional Material required.
Time Required to Complete program: 25 to 40 hours (based partly on data).
(3 sample pages)

SCIENCE - CHEMISTRY

BASIC SCIENCE SERIES: CHEMISTRY
Bowman, Glascock; TMI-GROLIER
3 sample pages:



36

There are 92 naturally occurring elements, plus some manmade ones.

Copy the number of naturally occurring elements we have now.

93 102 94 92 91

92

37

Which two of these atoms are atoms of the same element?

A. 10n 9+ 2 7
B. 9+ 10n 2 7
C. 10+ 10n 2 8

A. 10n 9+ 2 7
B. 9+ 10n 2 7

38

Match the following.

A.	electron	1.	0 charge
B.	proton	2.	+ charge
C.	neutron	3.	- charge

TEST

A.
B.
C.

39

In which of these does the number of protons differ from the number of neutrons?

A. 17+ 18n
B. 17+ 20n
C. 20+ 20n

A. 17+ 18n
B. 17+ 20n

40

Atoms of the same element do not always have the same number of neutrons.
Which is true?

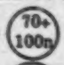
A. Atoms of the same element always have the same number of protons.
B. Atoms of the same element always have the same number of neutrons.
C. both
D. neither

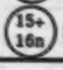
A. Atoms of the same element always have the same number of protons.

3-8

56

The atomic number of an element is equal to the number of protons in the nuclei of its atoms.

The atomic number of an atom having this nucleus  is 70.

The atomic number of an atom having this nucleus  is ( ).

15

57

The number of protons in the nuclei of the atoms of an element is equal to

the __________ __________ of that element.

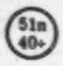
atomic number

58

This is the nucleus of an atom of one of the elements.

A. How many protons does it have?

B. What is its atomic number?



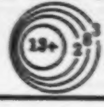
A. 40
B. 40

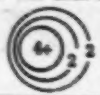
A.

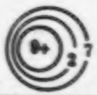
B.

59

Write "metal" or "nonmetal" for each diagram.

A. 

B. 

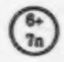
C. 

A. metal
B. metal
C. nonmetal

A.
B.
C.

60

The nucleus of this atom shows that the element made up of such atoms has an atomic number of ( ).

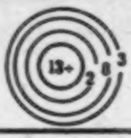


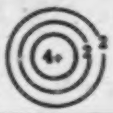
6

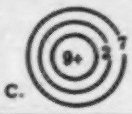
3-12

156

Write "metal" or "nonmetal" for each diagram.

A. 

B. 

C. 

A. metal
B. metal
C. nonmetal

A.
B.
C.

157

A certain atom has 24 neutrons and a mass number of 45. How many protons does it have?

21

158

RIDDLE
I am one of three atoms.
We all have the same atomic number.
We have different numbers of neutrons.
What are we called?

We are isotopes.

159

Isotopes have the same number of protons.
Which of these is also true?
A. Isotopes have the same mass numbers.
B. Isotopes have the same atomic numbers.
C. both
D. neither

B. Isotopes have the same atomic numbers.

160

An atom that has borrowed two electrons has a ( )( ) electrovalence.

-2

SCIENCE - CHEMISTRY

GAS LAWS H.S.
RENEE FORD, The Center for Programed Instruction, Inc. New York City.
Published by HOLT, RINEHART and WINSTON, INC.,
383 Madison Avenue, New York 16, N.Y.

Programed text, 600 frames, Cover (?), No. pp. (?), Page Size (?), $ (?) .
Teacher's Manual available, $ (?) .
Unit, Final, Diagnostic tests not available.
Constructed Responses usually used; some Multiple Choice and Branching.

INTENDED POPULATION: "High School Chemistry students."
Prerequisites: "Successful completion of one year of Algebra; reading level within 1 year of assigned grade."
No Additional Materials required.
Time Required to Complete program: 6 hours (based partly on data).
Student Data being used for revision.
(one sample page)

SCIENCE - CHEMISTRY

GAS LAWS
Ford; HOLT, RINEHART and WINSTON
one sample page:

Part C	**119.** One of the characteristics of a gas is that it expands when heated. For this reason we study the relation between pressure and volume at a fixed ☐
119. temperature	**120.** When we observe the relationship between the pressure and the volume of a confined gas, the temperature must be kept constant because gases ☐ when heated.
120. expand	**121.** In other words, when the temperature of a sample of gas is raised and the pressure is kept constant its ☐ increases.
121. volume	**162.** To convert centigrade to Kelvin: ☐ (a) 273 ☐ (b) the centigrade temperature. To convert Kelvin to centigrade: ☐ (c) 273 ☐ (d) the Kelvin temperature.
162. (a) add (b) to (c) subtract (d) from	**163.** (a) -5°C = ☐°K (b) 203°K = ☐°C
163. (a) 268°K If you did not answer this correctly, review items 146 - 153. (b) -70°C If you did not answer this correctly review items 154 - 161.	**164.** (a) 370°K = ☐°C (b) 47°C = ☐°K
164. (a) 97 (b) 320	

SCIENCE - CHEMISTRY

PHYSICAL SCIENCE SERIES: GAS LAWS High School +
JEAN MERSON, GPTC, consulting with
DR. MILTON KAHN
Published by GENERAL PROGRAMMED TEACHING
CORPORATION,
1719 Girard NE, Albuquerque, New Mexico

Programed text, 1000 frames, Paperback, $8\frac{1}{2}$" X 11", 200 pp., $ (?).
For use in GPTC and TMI machines; program reusable.
Teacher's Manual: "Instructions to the teacher are included in the preface."
No Unit, Diagnostic, or Final tests.
Constructed Responses and Multiple Choice Responses usually used; no Branching.

INTENDED POPULATION: "High School or Basic College Chemistry Students."
Prerequisites: "9th grade reading level; arithmetic proficiency."
No Additional Materials required.
Time Required to Complete progra[illegible] 5 hours (based solely on data.)
Student Data being used for revision.
(one sample page)

SCIENCE - CHEMISTRY

PHYSICAL SCIENCE SERIES: GAS LAWS
Merson, Kahn; GENERAL PROGRAMMED TEACHING CORPORATION
one sample page:

---

501)

If the volume is decreased, the pressure will _______

increase	

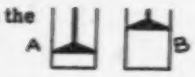
502)

All gases behave alike with respect to temperature, pressure, and volume changes. Will the pressure of H_2S change in the same way as the pressure of CH_4 under identical circumstances?

yes	

503)

If the piston is moved from A to B, the molecules will collide with the walls _______ often.



less	

504)

If the molecules collide with the walls less often, the pressure will _______

[✓ decrease]	increase	decrease

505)

If the volume is increased, the pressure will _______

decrease	

SCIENCE - CHEMISTRY

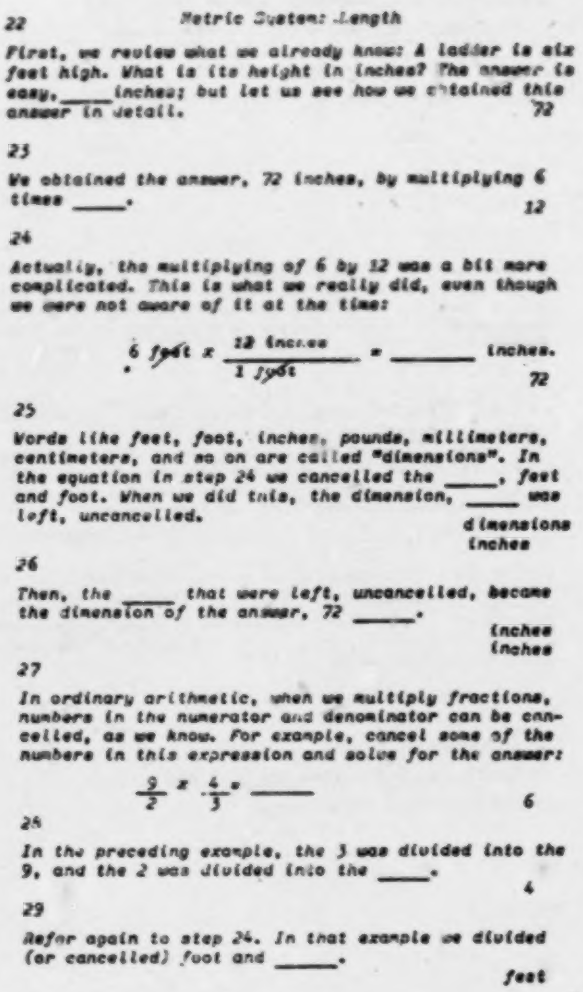
SELECTED TOPICS, FRESHMAN COLLEGE CHEMISTRY College
JAY A. YOUNG, Professor of Chemistry,
King's College, Wilkes-Barre, Penna.
Available from author.

Programed text, 5000 frames, Paperback, 500 pp., 8½" X 11",
Approximately $8.00.
Available in 8 separate units, $ (?) .
Teacher's Manual not available.
Constructed Responses usually used;
Multiple Choice Responses and Branching sometimes used.

INTENDED POPULATION: "Middle third of typical freshman class, college chemistry."
Prerequisites: "Algebra, ability to try to read intelligently."
No additional materials required.
Time Required to Complete program: 100 hours (based partly on data)
Student Data being used for revision.
(5 sample pages)

SCIENCE - CHEMISTRY

SELECTED TOPICS, FRESHMAN COLLEGE CHEMISTRY
JAY A. YOUNG
5 sample pages:



22 *Metric System: Length*

First, we review what we already know: A ladder is six feet high. What is its height in inches? The answer is easy, _____ inches; but let us see how we obtained this answer in detail.

72

23

We obtained the answer, 72 inches, by multiplying 6 times _____.

12

24

Actually, the multiplying of 6 by 12 was a bit more complicated. This is what we really did, even though we were not aware of it at the time:

$$6\ \cancel{\text{feet}} \times \frac{12\ \text{inches}}{1\ \cancel{\text{foot}}} = \underline{\qquad}\ \text{inches.}$$

72

25

Words like feet, foot, inches, pounds, millimeters, centimeters, and so on are called "dimensions". In the equation in step 24 we cancelled the _____, feet and foot. When we did this, the dimension, _____ was left, uncancelled.

dimensions
inches

26

Then, the _____ that were left, uncancelled, became the dimension of the answer, 72 _____.

inches
inches

27

In ordinary arithmetic, when we multiply fractions, numbers in the numerator and denominator can be cancelled, as we know. For example, cancel some of the numbers in this expression and solve for the answer:

$$\frac{9}{2} \times \frac{4}{3} = \underline{\qquad}$$

6

28

In the preceding example, the 3 was divided into the 9, and the 2 was divided into the _____.

4

29

Refer again to step 24. In that example we divided (or cancelled) foot and _____.

feet

33

No matter what we do, to get the oxygen's balanced, something else will be thrown off. In such a case, one must be bold, really bold. We shall really throw off the balance by picking a number which we are sure will not keep things in balance. Off hand, we pick the number, six, for SO_2. Now we have:

$$K_2Cr_2O_7 + H_2O + S \rightarrow Cr_2O_3 + 6SO_2 + 2KOH$$

And our table now reads:

Reagent side	Product side	
2K	2K	
2Cr		
8 O	____ O	
2H	2H	
1S	____ S	
		2Cr
		17
		6

34

Actually, our boldness did not seem to help much. But let us take a closer look. Perhaps the trouble is that the number of oxygens on the left is even and on the right the number of oxygens is _____.

odd

35

As long as this happens, things will never be balanced. They must be both even, or both _____ on both sides of the arrow. For no reason at all, but just to pick one or the other, we shall make the oxygens even on both sides. (If this does not work out, we shall begin all over, and make them both odd, on both sides.)

odd

36

Now to make the oxygens even on the right side, we must put an _____ number as a multiplier on the Cr_2O_3. We were bold last time, now let us be more timid. Pick a small even number, say, _____ the smallest one there is, not counting zero.

even
two

37

Now our equation reads:

$$K_2Cr_2O_7 + H_2O + S \rightarrow 2Cr_2O_3 + 6SO_2 + 2KOH$$

And the corrected table reads:

More Gas Problems

8

Let us try another problem. Early one morning, the pressure of the air inside an automobile tire was 2.8 atmospheres; the temperature of the air inside the tire was 15°C. Later in the day, after the automobile had been driven several miles, the temperature of the air inside the tire was measured and found to be 45°C. Assume that the volume of the interior of the tire was the same then as it was early in the morning. What was the pressure of the air in the tire later in the day?

9

Let us list what we know:

Early in the morning	Later in the day
R = ___L atm. per mole deg.	R = ___L atm. per mole deg.
P = ___ atm.	P = ___ atm.
V = ___ L	V = ___ L
T = ___$^\circ$A	T = ___$^\circ$A
n = ___ moles	n = ___ moles

0.0821	0.0821
2.8	unk.
unk.	unk.
288	318
unk.	unk.

10

The situation does not seem to be improved. Now we have ____ unknowns. To solve this problem we would need ___ equations.

five
five

11

Fortunately, with a little attention to the matter, we can find five equations. For example, for the air in the tire early in the morning we can write:

_____ = R

$\frac{P \times V}{n \times T}$

and for the air in the tire later in the day we can write:

_____ = R

$\frac{P \times V}{n \times T}$

12

The trouble is that these two equations look alike whereas, in fact, they are quite different. For example, the "T" in one equation represents 288°A and the "T" in the other equation represents ________$^\circ$A. 318

2

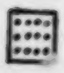


Figure 1

Now let us proceed to the development of the significance of the concept of concentration. In the illustration, figure 1, there is a square 1.0 cm on each side. By counting, we can see that there are _____ dots inside the square. The area of the square is _____ cm^2.

12
1.0

3

That is, in figure 1, the concentration of dots is ___ dots per _____ cm^2.

12
1.0

4

The word, "concentration" is always associated with the word "per". In figure 1, the concentration of dots is 12 dots _____ 1.0 cm^2.

per

5

The word, per, has several meanings. We are using it here to mean "for each", or "in each". Thus, if you work 10 hours for an employer and are paid \$250.00, your wage is \$25.00 _____ hour. Now, refer to figure 1; the concentration of dots in figure 1 is *_____.

per
12 dots per
1.0 cm^2

6

Mathematically, the word, per, indicates a division, or a fraction, which is the same thing. Thus, we might say, from our example, that your wage is $\frac{25.00 \text{ dollars}}{1 \text{ hour}}$. Or, in figure 1, writing the concentration of dots as a fraction, the concentration of dots is *_______.

$\frac{12 \text{ dots}}{1.0 \text{ cm}^2}$

7

As we know, we need not write a one when it appears in the denominator of a fraction, so, we could say that your wage is $25.00 \frac{\text{dollars}}{\text{hour}}$. Or, that the concentration of dots in figure 1 is *_____.

$12 \frac{\text{dots}}{\text{cm}^2}$

76

The next element to consider is carbon with six electrons, but first, let us review what we have learned, and extend our knowledge further. Then, for the other elements yet to be considered, we can proceed much more rapidly. Consider the 1s energy level. In any atom, there can only be one or _____, but not three or more, electrons in the 1s energy level.

two

77

The 1s energy level can only hold two electrons because, if we tried to put a third electron into this energy level, it would have the same _____ quantum numbers as one of the other two in that energy level and this is contrary to the _______ principle.

four
Pauli

78

Now, suppose that there are two electrons in the 1s energy level of an atom. These two electrons have the same principal quantum number, the ______ orbital-quantum number, the _______ magnetic quantum number, but a __________ spin quantum number.

same
same
different

79

Since only the spin quantum number of the two electrons in the 1s energy level is different, we might guess that the energy of the two electrons in the 1s energy level is almost the ______.

same

80

This is correct. If only the spin quantum numbers of two electrons are different (and the other three quantum numbers are the _____) the energies of two such electrons in an atom are almost the _______.

same
same

81

When two electrons in an atom differ only in their spin quantum numbers, the electrons are said to be in the same "orbital". Thus, both electrons in helium, for example (when helium is in the ground state) are 1s electrons, with ______ quantum numbers (principal, orbital and magnetic) the same, and with only the _____ quantum number different. Hence, these two electrons are said

SCIENCE - PHYSICS

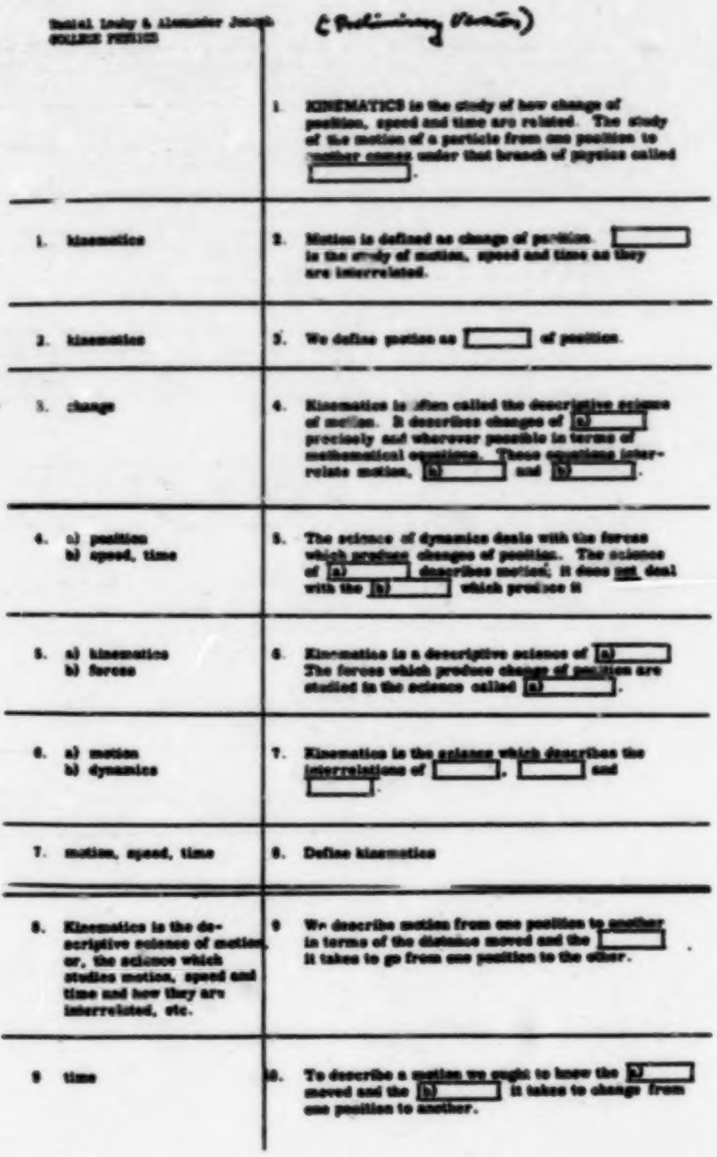
PROGRAMED COLLEGE PHYSICS Advanced H.S. - College
ALEXANDER JOSEPH, Bronx
Community College and
DANIEL LEAHY, Collegiate School and
The Center for Programed Instruction, Inc.
Published by JOHN WILEY & SONS, Inc.,
440 Park Avenue South, New York 16, N.Y.

Programed text, 12,000 frames. Paperback, 8½" X 11", 2500 pp., $15.00.
Probably also available for RECORDAK machine; program reusable.
Available in 5 separate units @ $3.00 each.
Teacher's Manual not available.
Unit tests available; reusable $ (?) .
Constructed Responses always used; no Multiple Choice; no Branching.

INTENDED POPULATION: "College and superior High School classes."
Prerequisites: "High School course with at least two years of math."
No Additional Material required.
Time Required to Complete program: (no data available.)
Student Data being used for revision.
(3 sample pages)

SCIENCE - PHYSICS

PROGRAMED COLLEGE PHYSICS
Joseph, Leahy; JOHN WILEY & SONS
3 sample pages:

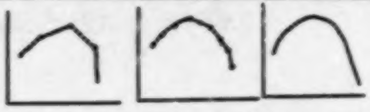


Daniel Leahy & Alexander Joseph
COLLEGE PHYSICS

(Preliminary Version)

	1. KINEMATICS is the study of how change of position, speed and time are related. The study of the motion of a particle from one position to another comes under that branch of physics called ______.
1. kinematics	2. Motion is defined as change of position. ______ is the study of motion, speed and time as they are interrelated.
2. kinematics	3. We define motion as ______ of position.
3. change	4. Kinematics is often called the descriptive science of motion. It describes changes of a) ______ precisely and wherever possible in terms of mathematical equations. These equations interrelate motion, b) ______ and b) ______.
4. a) position b) speed, time	5. The science of dynamics deals with the forces which produce changes of position. The science of a) ______ describes motion; it does not deal with the b) ______ which produce it
5. a) kinematics b) forces	6. Kinematics is a descriptive science of a) ______ The forces which produce change of position are studied in the science called a) ______.
6. a) motion b) dynamics	7. Kinematics is the science which describes the interrelations of ______, ______ and ______.
7. motion, speed, time	8. Define kinematics
8. Kinematics is the descriptive science of motion, or, the science which studies motion, speed and time and how they are interrelated, etc.	9 We describe motion from one position to another in terms of the distance moved and the ______ it takes to go from one position to the other.
9 time	10. To describe a motion we ought to know the a) ______ moved and the b) ______ it takes to change from one position to another.

		138.	The bottom cell of panel 8 is a summary of the equations we have just derived for $\boxed{\quad\quad}$. (what kind of motion?)
138	uniformly accelerated motion	139.	It is important to remember that these equations apply only to motions whose $\boxed{a)\quad\quad}$-time graph is a $\boxed{b)\quad\quad}$ line.
139	a) velocity b) straight	140.	These equations $\boxed{\quad\quad}$ apply to a straight line curve in a distance-time graph.
140	do not	141.	These equations $\boxed{\quad\quad}$ apply to a broken- or curved-line curve on a velocity-time graph.
141	do not	142.	Panel 8 The equations in the left hand column are those we have just derived from the figure above. They apply to all motions which are $\boxed{a)\quad\quad}$. complete
142	uniformly accelerated	143.	Panel 8 The equations recorded in the center column apply only to uniformly accelerated motion in which $t_1 = \boxed{\quad}$.
143	0 or zero	144.	Panel 8 If $t_1 = 0$, then $\Delta t = t_2 - 0 = t_2$. If we let $t_2 = t$ then $\Delta t = \boxed{\quad}$, when $t_1 = 0$.
144	t	145.	Panel 8 Assuming that $t_1 = 0$ and $\Delta t = t$, "$\Delta V = a\Delta t$" becomes "$\boxed{\quad\quad}$".
145	$\Delta V = at$	146.	Panel 8 and "$d = \frac{1}{2}a(\Delta t)^2 + V_1\Delta t$" becomes $\boxed{\quad\quad}$.

[illegible]	slope	174	If a curved line is a broken line made up of an indefinitely large number of very short straight lines, a [a) ______] line must then change its [b) ______] or [b) ______] an indefinitely large number of times in any given interval Δt.
[illegible]	a) curved b) slope, direction	175	 As the straight lines get shorter and approach points, the broken line approaches a [______] line
[illegible]	curved	176	A broken line changes its [______] whenever there is a point at which one straight line joins another
[illegible]	slope (direction)	177	A curved line thought of as a broken line in which component straight lines approach points, therefore changes its [______] at every point.
[illegible]	slope (direction)	178	A curved line graph changes its [a) ______] at [b) ______] point
[illegible]	a) slope, direction b) every	179.	If a distance time graph is a curved line, then its slope changes at every point or at every instant during an interval. This means that its [______] velocity changes at every instant in the interval
[illegible]	instantaneous	180	Slope is a graphical representation of velocity on a distance-time graph. The instantaneous velocity of a motion represented by a curved line on such a graph [______] at every point
[illegible]	changes, varies	181	A certain motion is represented by a curved line on a distance-time graph. To determine its [a) ______] velocity we must determine the [b) ______] of the curve at some instant t_1.

SCIENCE - PSYCHOLOGY

THE ANALYSIS OF BEHAVIOR College +
A Program for Self-Instruction
JAMES G. HOLLAND, Research Fellow and
B. F. SKINNER, Professor, Psychology Dept.,
Harvard University
Published by McGRAW-HILL BOOK COMPANY,
330 West 42nd Street, New York 36, N.Y.

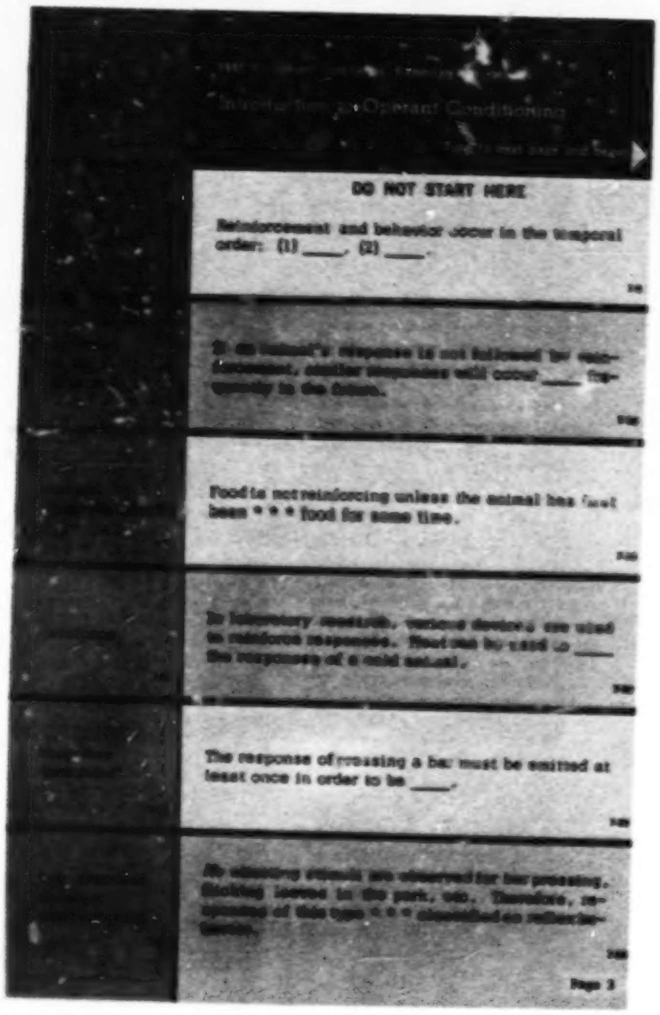
Programed text, 2,000 frames, 6" X 9", 338 pp.,
Hardcover $5.95
Paperback $3.50
For use in Rheem Califone, Foringer and possibly Koncept-O-Graph machines (Sept., 1962) program reusable.
Teacher's Manual not available.
Unit and Final tests not available.
Diagnostic tests incorporated in program.
Constructed Responses always used; no Multiple Choice; no Branching.

INTENDED POPULATION: "psychology, education, and programming students."
Prerequisites: None.
No Additional Equipment required.
Time Required to Complete the program: 14-15 hours (based solely on data)
(two sample pages)

SCIENCE - PSYCHOLOGY

THE ANALYSIS OF BEHAVIOR
Holland, Skinner; McGRAW-HILL
two sample pages:

Holland-Skinner: The Analysis of Behavior



Introduction to Operant Conditioning

DO NOT START HERE

Reinforcement and behavior occur in the temporal order: (1) ____, (2) ____.

[illegible]

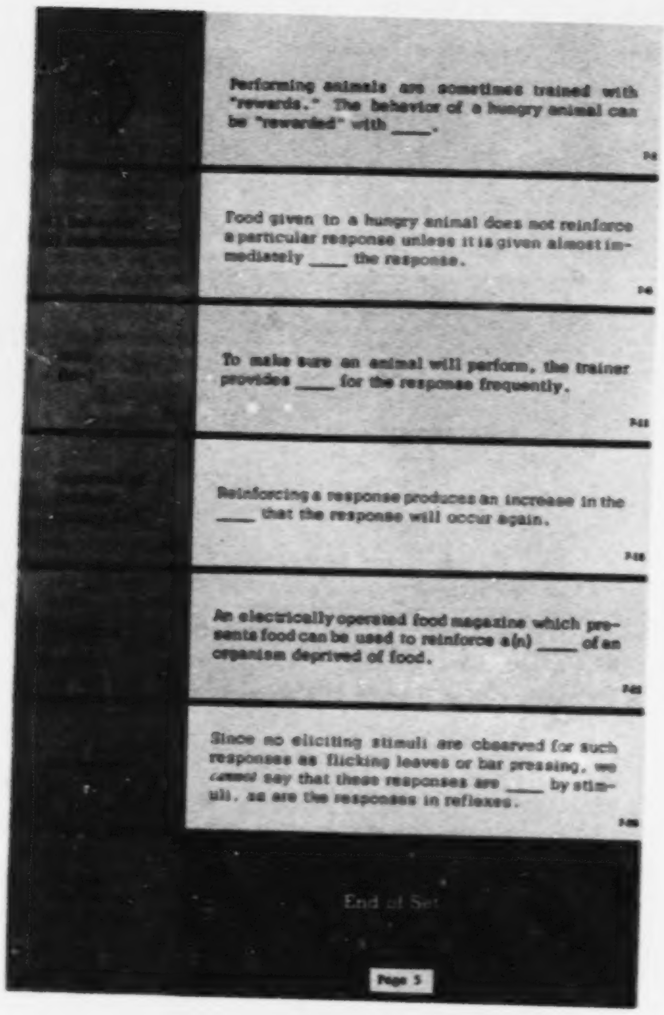
Food is not reinforcing unless the animal has first been * * * food for some time.

[illegible]

The response of pressing a bar must be emitted at least once in order to be ____.

[illegible]

Page 3



Performing animals are sometimes trained with "rewards." The behavior of a hungry animal can be "rewarded" with ____.

Food given to a hungry animal does not reinforce a particular response unless it is given almost immediately ____ the response.

To make sure an animal will perform, the trainer provides ____ for the response frequently.

Reinforcing a response produces an increase in the ____ that the response will occur again.

An electrically operated food magazine which presents food can be used to reinforce a(n) ____ of an organism deprived of food.

Since no eliciting stimuli are observed for such responses as flicking leaves or bar pressing, we *cannot* say that these responses are ____ by stimuli, as are the responses in reflexes.

End of Set

Page 5

SCIENCE - PSYCHOLOGY

STUDENT GUIDE with Programed Units for Hilgard's INTRODUCTION TO PSYCHOLOGY College +
RICHARD C. TEEVAN, Psychology Department, Bucknell University, and
EARL L. JANDRON, Psychology Department, San Jose State College.
Published by HARCOURT, BRACE & WORLD, Inc.
750 Third Ave., New York 17, N.Y.

Programed Text, 1350 frames, Paperback, 160 pp., 8 1/4" X 11", $2.50
Teacher's Manual available; free.
Unit tests available for basic text; one copy free.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "College freshmen or sophomores."
Prerequisites: "College entrance."
No Additional Materials required.
Time Required to Complete the program: 13 - 24 hours (based solely on data.)
Student Data being used for revision.
(one sample page)

SCIENCE - PSYCHOLOGY

STUDENT GUIDE with Programed Units for Hilgard's
INTRODUCTION TO PSYCHOLOGY
Teevan, Jandron; HARCOURT, BRACE & WORLD
one sample page:

Chapter Eleven

THE MANAGEMENT OF LEARNING

rest	1	By massed practice we mean putting trials or practice sessions close together, that is, having a subject continue with one trial right after the other without any __________ periods in between.
massed	2	If we have a subject learning a list of nonsense syllables (a common experiment in learning) and we tell him to continue on the next trial each time he gets to the end of the list, without resting in between, we have instructed him to use __________ practice.
trials	3	Distributed practice, on the other hand, implies rest periods in between __________, or sessions.
distributed	4	If we ask the subject who is learning nonsense syllables to rest for one minute between each trial, we are using __________ practice.
distributed	5	It has been found in many experiments that the rest period between trials seems to improve the efficiency of learning. Therefore it is stated that, in general, the __________ practice method is the better one to use.
distributed massed	6	In spite of the fact that __________ practice is, in general, better than __________ practice, there are some conditions under which the latter is the better method to use. These exceptions to the general rule are pointed out in the text.
not	7	In memorizing a poem, then, one can use either the distributed practice or the massed practice method. It was pointed out above that the distributed method is usually better although this rule does ______ always hold true.
whole	8	In memorizing a poem, you would probably also want to decide whether to learn the poem one stanza at a time or try to learn it as a w______.
together	9	If one learns the poem one stanza at a time he is using the part method. The idea here is that once one knows each stanza, he can then put the stanzas __________ and recite the poem from beginning to end.

(Reproduced from Manuscript Copy)

From Student Guide with Programed Units for Hilgard's Introduction to Psychology: Third Edition, by Richard C. Teevan and Earl L. Jandron, © 1962 by Harcourt, Brace & World, Inc., and reprinted with their permission.

APPLIED SCIENCE

BASIC ELECTRONICS 07 H.S.

Published by EDUCATION ENGINEERING, Inc.,
3810 Pacific Coast Highway, Torrance, Calif.

7560 frames, for use in "SPEED" machine, $70; program reusable. Programed text, Paperback, 252 pages, 5" X 7", 7 separate units @ $3.75 each.
Teacher's Manual available @ $4.00 per unit.
Unit, Final, Diagnostic Tests available @ $3.75 each, tests reusable.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

INTENDED POPULATION:
Student Prerequisites: Arithmetic, elementary algebra.
Additional Equipment required: "SPEED" teaching machine, $700 & $850.
Time Required to Complete program: 14 hours (based partly on data).
Student Data being used for revision.
(one sample page)

APPLIED SCIENCE

BASIC ELECTRONICS
EDUCATION ENGINEERING
one sample page:

OHM'S LAW

In 1826, Simon Ohm, a German physicist, discovered that a definite relationship exists between current, voltage and resistance. Using very poor and deficient apparatus, he devised what is known as Ohm's law, a very powerful tool in solving electrical circuit problems.

Ohm's law states that the current in an electrical circuit is proportional to the voltage and inversely proportional to the resistance.

0701-S01

Ohm's law is represented in three forms. One form is that the current, equals the voltage divided by the resistance, that is,

$$\text{Current} = \frac{\text{Voltage}}{\text{Resistance}},$$

or in symbol form,

$$I = \frac{E}{R}.$$

where the units are:

ampere for I
volt for E
Ohm for R

To summarize,

$$\text{Current} = \frac{\text{Voltage}}{\text{Resistance}}.$$

$$I(\text{amperes}) = \frac{E(\text{volts})}{R(\text{ohms})}$$

1. Volt represents the symbol ___ in Ohm's law.
2. Ohm represents the symbol _____ in Ohm's law.
3. Ampere represents the symbol ___ in Ohm's law.
4. Ohm's law states that the current is equal to the voltage divided by the ________.
5. A battery in a circuit would represent the _____ in Ohm's law.

1. Voltage
2. R
3. Resistance
4. Current
5. Ohms
6. I
7. C
8. O
9. E
10. V

0701-Q01

APPLIED SCIENCE

CAPACITANCE AND CAPACITORS College
ROBERT H. KANTOR, Programmer,
Varian Associates
Published by VARIAN ASSOCIATES,
611 Hansen Way, Palo Alto, Calif.

Programed Text, 115 frames, Paperback, 120 pp., 6" X 9", $3.00.
Teacher's Manual not available.
Final and Diagnostic tests included in the program; reusable.
Multiple Choice and Branching always used; no Constructed Responses.

INTENDED POPULATION: "First or second year college physics students."
Prerequisites: "First part of an elementary college course in electricity and magnetism (more specifically, the first seven chapters of Electricity and Magnetism by Sears, or equivalent text)."
No Additional Material required.
Time Required to Complete program: 2 hours (based solely on data.)
Student Data being used for revisions.
(one sample page)

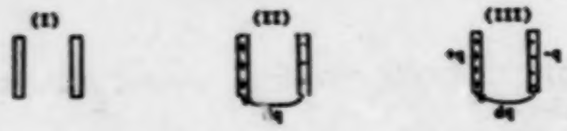
APPLIED SCIENCE

CAPACITANCE AND CAPACITORS

Kantor; VARIAN ASSOCIATES
one sample page:

We are now ready to study energy relationships in a capacitor. The process of charging a capacitor consists of transferring charge from the plate at lower potential to the plate at higher potential. The charging process therefore requires the expenditure of energy.

Imagine the charging process to be carried out by starting out with both plates completely uncharged, and then repeatedly removing small positive charge dq from one plate and transferring them to the other plate.



At a stage of this process when the total quantity of charge transferred has reached an amount q, (picture III above) the potential difference between the plates is

$$V = \frac{q}{C}$$

and the work dW necessary to transfer the next charge dq is

$$dW = V\ dq = \frac{q}{C}\ dq$$

What do you think we should do now?

(a) Integrate . . . . page 69 ☐
(b) Express C in terms of q, then integrate . . . . . page 71 ☐

KLYSTRONS

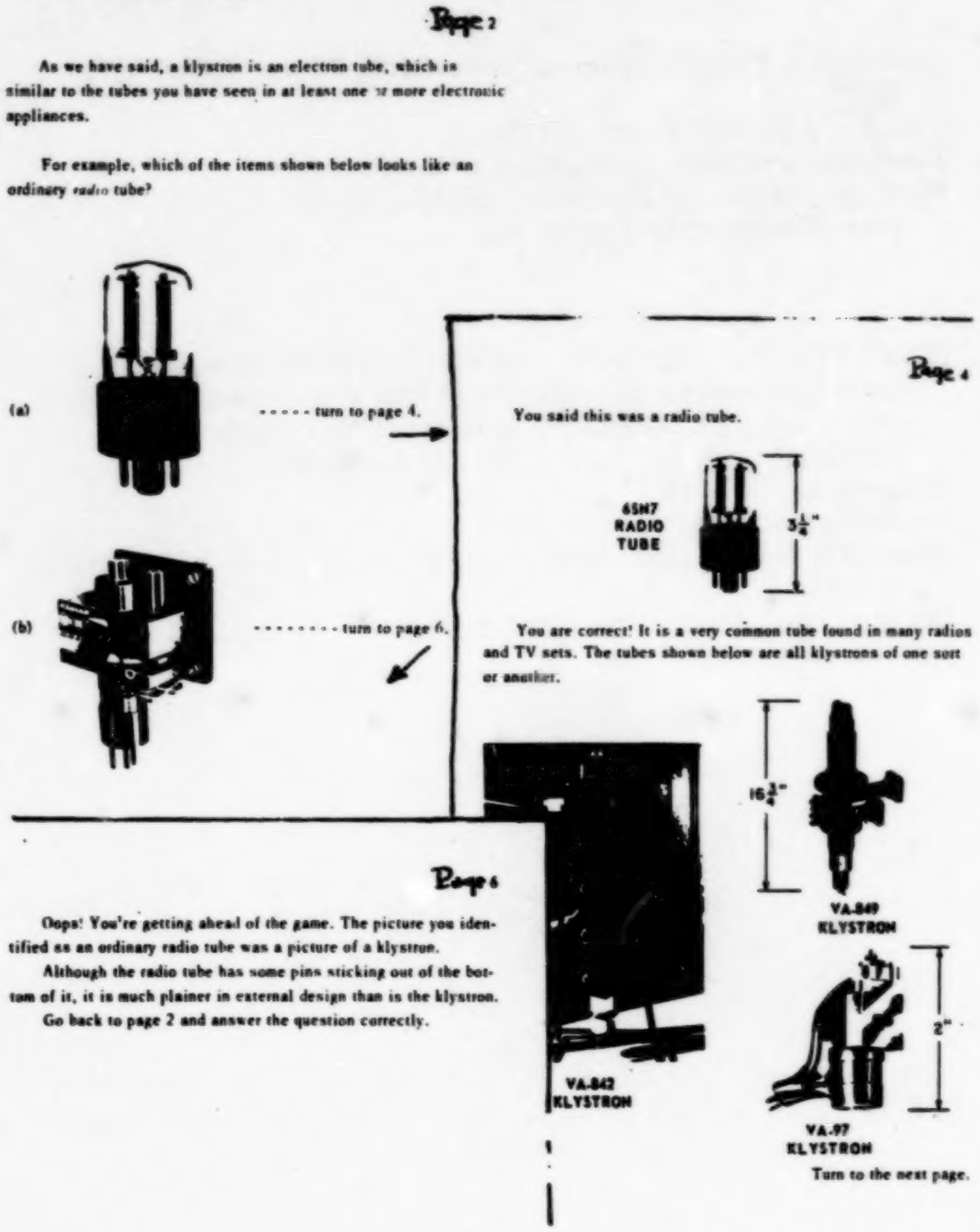
ROBERT H. KANTOR, Programmer, and
ROBERT F. MAGER, Senior Scientist,
Varian Associates.
Published by VARIAN ASSOCIATES,
611 Hansen Way, Palo Alto, Calif.

Programed Text, 85 frames, Paperback, 93 pp., $5\frac{1}{2}$" X $8\frac{1}{2}$", $2.00.
Teacher's Manual not available.
Final test included in program; reusable.
Multiple Choice and Branching usually used; some Constructed Responses.

INTENDED POPULATION: "Though originally designed for and addressed to the wives of Varian employees, the book proved to be of considerable interest to a much wider audience" ... from the Preface, 2nd edition.
Prerequisites: None.
No Additional Material required.
Time Required to Complete program: 50 minutes (based solely on data.)
Student Data used in Program revision.
(one sample page)

APPLIED SCIENCE

KLYSTRONS
Kantor, Mager; VARIAN ASSOCIATES
one sample page:



Page 2

As we have said, a klystron is an electron tube, which is similar to the tubes you have seen in at least one or more electronic appliances.

For example, which of the items shown below looks like an ordinary *radio* tube?

(a) - - - - - turn to page 4.

(b) - - - - - - - - turn to page 6.

Page 4

You said this was a radio tube.

6SN7
RADIO
TUBE

$3\frac{1}{4}$"

You are correct! It is a very common tube found in many radios and TV sets. The tubes shown below are all klystrons of one sort or another.

$16\frac{3}{4}$"

VA-849
KLYSTRON

VA-842
KLYSTRON

2"

VA-97
KLYSTRON

Turn to the next page.

Page 6

Oops! You're getting ahead of the game. The picture you identified as an ordinary radio tube was a picture of a klystron.

Although the radio tube has some pins sticking out of the bottom of it, it is much plainer in external design than is the klystron.

Go back to page 2 and answer the question correctly.

APPLIED SCIENCE

RELAYS
ROBERT H. KANTOR, Programmer, and
ROBERT F. MAGER, Senior Scientist,
Varian Associates
Published by VARIAN ASSOCIATES,
611 Hansen Way, Palo Alto, Calif.

Programed Text, 95 frames,
Spiralbound Paperback, 100 pp., 5½" X 8½",
$ .85.
No Teacher's Manual available.
Final and Diagnostic tests included in program; reusable.
Multiple Choice Responses and Branching usually used;
some Constructed Responses.

INTENDED POPULATION:
Prerequisites: "Can pass quiz on gross concept of a circuit
(not included).
Can pass quiz on switches (included).
No Additional Material required.
Time Required to Complete program: 75 minutes (based solely
on data).
Student Data used in Program revision.
(one sample page)

APPLIED SCIENCE

RELAYS

Kantor, Mager; VARIAN ASSOCIATES

one sample page:

Page 1

This book has been constructed on the basis of three assumptions. It assumes that you:

1. Understand the concept of a circuit.

If you are not sure that you do know what an OPEN and a CLOSED circuit are, turn now to Page 3 for a brief review.

2. Have read Volume I on Switches.

If you have not, or if that volume is not available to you, you will find a concise summary of important ideas on Page 4.

3. Understand the basic operation of an electromagnet.

A brief explanation can be found on Page 6, and you should turn to that page now if you do not know how a simple electromagnet is made, and how it operates.

If you think you meet the three prerequisites listed above, turn to Page 7.

Page 2

You did not follow instructions. Nowhere in this book are you directed to this page.

In this kind of book you do not read pages consecutively, as you do in ordinary books. Material is sequenced to allow everyone to learn at the rate best for him, by directing him to the pages that contain the information he needs.

Now go back to Page 1 and try again.

APPLIED SCIENCES

SWITCHES

ROBERT F. MAGER, Senior Scientist,
Varian Associates
Published by VARIAN ASSOCIATES,
611 Hansen Way, Palo Alto, Calif.

Programed Text, 58 frames, Spiralbound Paperback,
66 pp., $5\frac{1}{2}$" X $8\frac{1}{2}$",
$ .75.
Teacher's Manual not available.
Unit Tests included in program.
Diagnostic Tests (see Prerequisites, below)
Final Test available; test reusable.
Multiple Choice and Branching always used; no Constructed Responses.

INTENDED POPULATION:
Prerequisites: "Can pass quiz (not included) on gross concept of a circuit."
No Additional Material required.
Time Required to Complete program: 40 minutes (based solely on data.)
Student Data used in program revision.
(one sample page)

APPLIED SCIENCES

SWITCHES
Mager; VARIAN ASSOCIATES
one sample page:

Page 9

In this book you will learn how to NAME some of the switches used in electrical and electronic circuits, and you will learn the SYMBOLS used to represent these switches on circuit diagrams.

When you have successfully finished the book, you will be able to:

a. tell what a switch is and what it does,
b. name the important parts of a switch,
c. designate (name) a switch by looking at its schematic symbol.

(You will NOT be expected to be able to draw switches schematically, through you could even do this with a little guided practice.)

This material is not at all difficult, so let's begin.

A SWITCH is a mechanical device for controlling the flow of electricity through a circuit. When a switch allows electricity to flow through it, we say that the switch is ON, or CLOSED. When no electricity is allowed through the switch, we say the switch is OFF, or OPEN.

If you operated the light switch on your wall and the light came on, would the switch be OPEN or CLOSED?

If your answer is OPEN, turn to page 5.

If your answer is CLOSED, turn to page 12.

Page 5

Your answer was "OPEN."

Let me explain again. When electricity is allowed through a switch, and the circuit is operating, we say the switch is CLOSED. When a switch is OPEN, the circuit is OFF, or not operating.

Now return to page 9 and read the page again.

Page 12

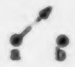
You answered "CLOSED."

RIGHT you are! When the switch is closed, electricity can pass through the switch and the circuit controlled by the switch can operate.

A switch has two or more contacts, depending on the number of circuits it is built to control. The stationary contact is indicated schematically by a dot, and the movable contact is indicated by a dot with an arrow extending from it.

A switch will always have at least one stationary contact, and at least one movable contact.

In the switch shown schematically below, which is the movable contact?



pg. 7 a
pg. 10 b

BASIC SCIENCE SERIES:
FUNDAMENTALS OF ELECTRICITY
Direct Current
DONALD T. TOSTI, Programer, consulting with
Dr. R. K. MOORE, Chmn. E. E. Dept., U/N. Mex., and
W. B. MAXSON, Sandia Lab
Published by TMI-GROLIER
575 Lexington Avenue, New York 22, N.Y.

High School +

Programed text, 1453 frames, Vinyl cover, 291 pp., 8½" X 11", $10.00.
For use in Min/Max, Min/Max II machines; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
"No tests available other than those enclosed with course," not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

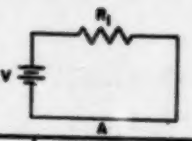
INTENDED POPULATION: "high-school students and adults."
Prerequisites: "grade-school education, including 7th grade knowledge of arithmetic."
No Additional Materials required.
Time Required to Complete program: 15 to 20 hours (based solely on data).
(one sample page)

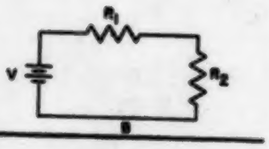
APPLIED SCIENCE

BASIC SCIENCE SERIES:
FUNDAMENTALS OF ELECTRICITY

Tosti, Moore, Maxson; TMI-GROLIER
one sample page:

1371 If we add more resistance to a circuit, less current will flow. More current will flow in circuit (__) than in circuit (__).





A B

1372 From the equation $t = \frac{Q}{I}$, we see that if less current flows it will take longer for the same amount of charge to flow. How long will it take for 40 coulombs to flow if the current is 2a? ________. If the current is 1/2a? ________

$t = \frac{Q}{I} = \frac{40}{2} = 20$ sec.

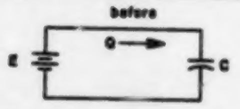
$t = \frac{Q}{I} = \frac{40}{1/2} = 80$ sec.

Note: We see that it takes four times longer for the charge to flow.

1373 If more current flows, it will take ________ time for the same charge to flow.

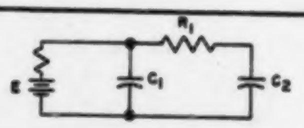
less

1374 If we put a resistor in, it will take more time for ________ to flow to the capacitor.



charge

1375 The more resistance we put in series, the longer it takes to charge the capacitor. It takes longer to charge capacitor (__) than capacitor (__).



C_2 C_1

375

SOCIAL STUDIES

YOUR PERSONAL TUTOR IN: HOW A BILL GOES THROUGH CONGRESS Jr. H.S.
INRAD, P.O. Box 4456, Lubbock, Texas

Programed text, 382 frames, Paperback, $ (?)
For use in AVTA machine; reusable.
No Teacher's Manual available.
Final test available; reusable.
Constructed Responses used usually; some Multiple Choice; no Branching

INTENDED POPULATION: "8th grade."
Prerequisites:
No Additional Material required.
Time Required to Complete the program: 5 hours (based partly on data.)
Student Data being used for revision.
(one sample page)

SOCIAL STUDIES

YOUR PERSONAL TUTOR IN: HOW A BILL GOES THROUGH CONGRESS
INRAD
one sample page:

EXTRACTS FROM HOW A BILL GOES THROUGH CONGRESS

---

97. The procedure for getting bills through Congress is similar, whether they originate in the Senate or the ________ of Representatives. We will follow the course of a bill as it goes through the House of ______________ and on through the Senate.

House
Representatives

---

98. Bills, to be introduced, are placed in the "hopper" on the desk of the Clerk of the House of ________________.

Representatives

---

99. A "hopper" is a tray, basket or box hanging on the end of the desk of the Clerk of the __________.

House

---

100. The Clerk of the House takes a bill from the hopper and reads the title of the bill to the House of ________________.

Representatives

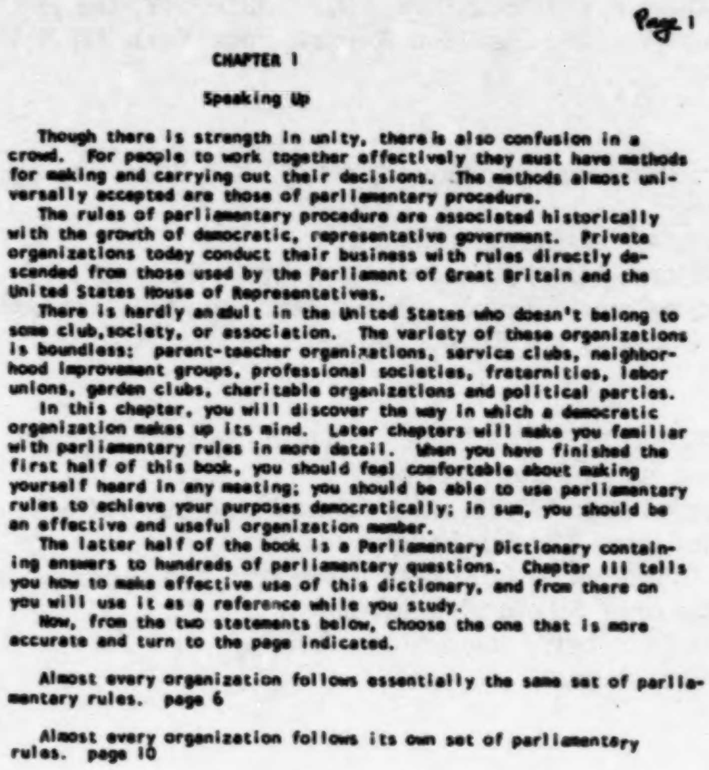
PARLIAMENTARY PROCEDURE H.S.
WARREN LEHMAN, Sociologist,
under direction of USI Educational
Science Division
Published by DOUBLEDAY AND COMPANY, Inc.,
575 Madison Avenue, New York 22, N.Y.

Programed text, Hardcover, 8 1/4" X 5 3/8", 344 pp.,
$4.95.
No Teacher's Manual available.
Unit, Final, Diagnostic tests not available.
Multiple Choice Responses and Branching always used;
no Constructed Responses.

INTENDED POPULATION: "Originally trade market,
some school use possible."
Prerequisites: "Varies with school and subject area."
No Additional Material required.
Time Required to Complete program: "65 pages an hour,
little over 5 hours" (estimate).
Student Data being used for revision.
(2 sample pages)

SOCIAL STUDIES

PARLIAMENTARY PROCEDURE
Lehman; DOUBLEDAY
2 sample pages:



Page 1

CHAPTER I

Speaking Up

Though there is strength in unity, there is also confusion in a crowd. For people to work together effectively they must have methods for making and carrying out their decisions. The methods almost universally accepted are those of parliamentary procedure.

The rules of parliamentary procedure are associated historically with the growth of democratic, representative government. Private organizations today conduct their business with rules directly descended from those used by the Parliament of Great Britain and the United States House of Representatives.

There is hardly an adult in the United States who doesn't belong to some club, society, or association. The variety of these organizations is boundless: parent-teacher organizations, service clubs, neighborhood improvement groups, professional societies, fraternities, labor unions, garden clubs, charitable organizations and political parties.

In this chapter, you will discover the way in which a democratic organization makes up its mind. Later chapters will make you familiar with parliamentary rules in more detail. When you have finished the first half of this book, you should feel comfortable about making yourself heard in any meeting; you should be able to use parliamentary rules to achieve your purposes democratically; in sum, you should be an effective and useful organization member.

The latter half of the book is a Parliamentary Dictionary containing answers to hundreds of parliamentary questions. Chapter III tells you how to make effective use of this dictionary, and from there on you will use it as a reference while you study.

Now, from the two statements below, choose the one that is more accurate and turn to the page indicated.

Almost every organization follows essentially the same set of parliamentary rules. page 6

Almost every organization follows its own set of parliamentary rules. page 10

Page 6
(from page 1)

YOUR ANSWER: Almost every organization follows essentially the same set of parliamentary rules.

This is true. Although many groups change the standard rules in one small way or another, the basic rules are used in almost all groups, from the local fraternal organization to the United Nations, and from the Parent-Teacher Association to the United States House of Representatives. Some vary the names for officers, some the order in which meetings are conducted, some the number of votes necessary to pass certain types of measures, but the differences are small compared to the similarities. Once learned, the rules of procedure should guide you in whatever organizational work you do.

One of the names that varies from organization to organization is that of the person who has the job or running the meeting. Generally, such a person may be called the presiding officer. The presiding officer of the Senate is the Vice-President of the United States. The presiding officer of the House of Representatives is called the Speaker of the House. Sometimes a presiding officer is called a chairman, moderator, or president. Whatever the name, though, the duties are much the same. The presiding officer, sometimes referred to impersonally as the chair, has the job of supervising the meetings of the organization. In one sense, the job of the chair is to see that the rules of procedure are followed.

But what is the purpose of those rules?

To keep order in the meeting. page 9

To ensure that meetings are conducted as quickly as possible. page 13

To ensure that organizations can achieve their purposes democratically. page 16

Page 10
(from page 1)

YOUR ANSWER: Almost every organization has its own set of parliamentary rules.

Your answer is not quite right. Although many organizations make small changes in the standard rules to fit their particular needs, almost all groups are set up in much the same way and carry on business in accordance with traditional rules. The aim of parliamentary procedure is to see that the organization runs efficiently and democratically. The rules developed in Parliament and modified in the United States House of Representatives suit this aim very well. Almost every organization uses these rules, either precisely as you find them in this book or with only minor local changes.

If the differences among the procedures were great, there would be little point in learning rules of order. But a world in which every organization had its own rules would be far more confusing than the present one. Return to page 1 and choose the statement that more accurately describes the world in which (as you will see) all meetings can be orderly.

SOCIAL STUDIES

PARLIAMENTARY PROCEDURE 29
GEORGE M. SNYDER, Programer
Published by EDUCATION ENGINEERING, INC.,
3810 Pacific Coast Highway, Torrance, Calif.

3240 frames, for use in "SPEED" machine, $30; program reusable
Programed text, Paperback, 108 pages, 5" X 7",
3 separate units @ $3.75 each.
Teacher's Manual available @ $4.00 per unit.
Unit, Final, Diagnostic Tests available @ $3.75 each, tests reusable.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

INTENDED POPULATION:
Student Prerequisites:
Additional Equipment required: "SPEED" teaching machine, $700 & $850.
Time Required to Complete program: 5 hours (based partly on data)
Student Data being used for revision.
(two sample pages)

SOCIAL STUDIES

PARLIAMENTARY PROCEDURE 29
Snyder; EDUCATION ENGINEERING
two sample pages:

●● THE "MINUTES"

The "minutes" of meetings, when approved, are the official record of actions taken. The secretary is custodian of the permanent minute book which is available for examination by any member.

The "minutes" should include

1. **All motions or resolutions whether carried or lost.**
2. **The names of the proposers of main motions.**
3. **Reports of officers and committees in brief (the entire report should be submitted in writing and filed).**
4. **The signature of the secretary, and the date the minutes were approved.**
5. **The opening sentence should contain the kind of meeting, name of the organization; the time, date, and place of the meeting, and the name of the chairman.**

NOTE: The minutes should not include the personal opinions of the secretary. "Just the facts, Ma'm."

29S01 - 09

QUESTIONS

Fill in the blanks.

1. **The minutes should include all ________ whether carried or lost.**
2. **They should include reports in brief of ________.**
3. **They should include the ________ of the secretary, and the date the minutes were ________.**
4. **The opening sentence should contain the ________ of meeting, and the ________ of the organization.**
5. **The minutes should not include the ________ of the secretary.**

ANSWERS

1. **full discussion**
2. **club dances**
3. **telephone number, rejected**
4. **signature, approved**
5. **motions or resolutions**
6. **officers and committees**
7. **personal opinions**
8. **purpose, aims**
9. **names of proposers**
10. **kind, name**

29Q01 - 09

PRIVILEGED MOTIONS

The motion TO TAKE A RECESS allows an assembly to adjourn for a short time. After the recess, business resumes at the point where recess took place.

Second. No debate. Amendable as to time. Majority.

TO RISE TO A QUESTION OF PRIVILEGE relates to the needs of the assembly or a member, which require immediate action (heat, light, dead mike, announcement, etc.).

Member (not waiting):"Mr. Chairman, I rise to a question of privilege."

Chairman: " State your question of privilege."

No second. No debate. Chairman decides.

TO CALL FOR ORDERS OF THE DAY reminds the chairman of business to be considered at that particular time.

No second. No debate. No vote.

29S02-17

QUESTIONS

Fill in the blank.

1. The motion to recess allows the assembly _____ for a short time.
2. The motion to recess is _____ as to time.
3. The motion to rise to a question of privilege is decided by _____.
4. It relates to the needs of the assembly which require _____.
5. A call for orders of the day requires _____ vote.

ANSWERS

1. no
2. amendable
3. majority
4. no regular order
5. immediate action
6. to adjourn
7. the chairman
8. the assembly
9. debatable
10. to rest

29Q02-17

SOCIAL STUDIES

STUDY GUIDE FOR UNITED STATES HISTORY **H.S.**
GERALD L. JENSEN, Coordinator of Secondary Education, Imperial County Schools.
Available from author, 1267 Wensley Avenue,
El Centro, California

For use in JENSEN'S TUTOR teaching device;
Study Guide, $3.00.
Teacher's Manual available, 50¢.
Envelope Answer Sheets, 7¢ ea.; Key-Inserts 25¢ ea.
Unit, Final, Diagnostic tests available; $ (?); reusable.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

INTENDED POPULATION: "8th and 11th grade students."
Prerequisites: None.
Additional Material required: suitable American History source (text, etc.)
Time Required to Complete program: 2 semesters (rough estimate).
Student Data being used for revision.
(one sample page)

SOCIAL STUDIES

STUDY GUIDE FOR UNITED STATES HISTORY
GERALD L. JENSEN
(one sample page)

CHAPTER 7
THE COLONIES WIN THEIR INDEPENDENCE *

DIRECTIONS:

Do the assignments as indicated in these exercises unless they are modified by your teacher.

When you are instructed to "Do items", indicate your answers on the Envelope-Answer Sheet of JENSEN'S TUTOR. When you are asked to do something requiring paper, provide your own.

Each of the items to be used with JENSEN'S TUTOR is made up of four statements. Two are true and two are false. Your job is to select the two that are true. Thus, you must give two answers per item. Read all four statements before answering.

Indicate an answer by drawing your pencil back and forth in the square, on the Envelope-Answer Sheet, opposite the number of the item you are doing and under the letter of the statement that you think is true.

If your answer is correct you will break through the envelope into a small hole. The holes are usually in the centers of the squares but not always. So, scribble over the entire square before trying another answer. Do not make marks of any kind on an Envelope-Answer Sheet unless you are indicating an answer or writing your name and other identifying information.

If you do not break through, reconsider the item and try again. Keep trying until you get the correct answers, but try to avoid making mistakes. Think! Use your text if you have to in order to avoid making mistakes.

Correct the errors you make by re-writing false statements to make them true and or by other suitable correction. Make corrections before going on to the next item.

Begin answering in the middle column. (9-3 M).

ASSIGNMENT ONE
OVERVIEW AND FIRST READING

Study the organization of the chapter.

Change the primary headings to question form.

Do item 1.

1-A "The Battles of Lexington and Concord", would be a better primary heading for chapter 7 than, "The beginning of war."
B "The Declaration of Independence", would be a better primary heading for chapter 7 than, "Reactions to the Declaration of Independence."

---

* These exercises were devised by Gerald L. Jensen, 1267 Wensley Avenue, El Centro, California. They are based on chapter 7 of, Rise of the American Nation by Todd and Curti. Harcourt Brace and Company, Inc. Burlingame, Calif. 1961. Copyright 1961 by Gerald L. Jensen.

SOCIAL STUDIES

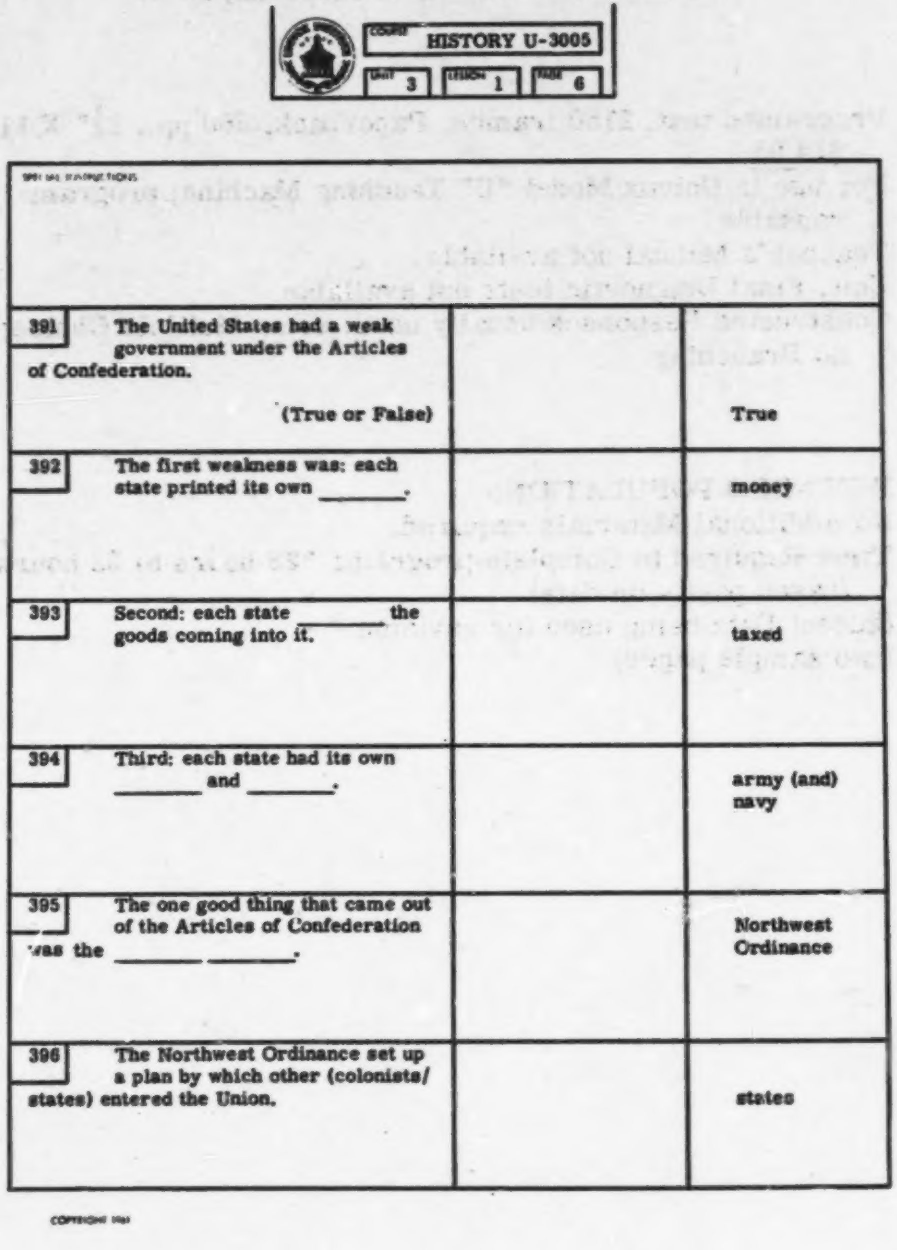
HISTORY OF THE UNITED STATES U-3005
UNIVOX INSTITUTE, INC.
Published by UNIVERSAL ELECTRONICS
LABORATORIES CORP.,
510 Hudson Street, Hackensack, N. J.

Programed text, 2160 frames, Paperback, 360 pp., 8½" X 11", $14.95.
For use in Univox Model "U" Teaching Machine; program reusable.
Teacher's Manual not available.
Unit, Final Diagnostic tests not available.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION:
No Additional Materials required.
Time Required to Complete program: "28 hours to 32 hours" (based partly on data)
Student Data being used for revision.
(two sample pages)

SOCIAL STUDIES

HISTORY OF THE UNITED STATES U-3005
Univox Institute, Inc.; UNIVERSAL ELECTRONICS LABORATORIES
two sample pages:



COURSE **HISTORY U-3005**
UNIT **3** LESSON **1** PAGE **6**

SPECIAL INSTRUCTIONS

391 The United States had a weak government under the Articles of Confederation. (True or False)		True
392 The first weakness was: each state printed its own ________.		money
393 Second: each state ________ the goods coming into it.		taxed
394 Third: each state had its own ________ and ________.		army (and) navy
395 The one good thing that came out of the Articles of Confederation was the ________ ________.		Northwest Ordinance
396 The Northwest Ordinance set up a plan by which other (colonists/states) entered the Union.		states

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COURSE HISTORY U-3005

UNIT 3 LESSON 5 PAGE 1

SPECIAL INSTRUCTION:

505 **We have now learned about two branches of government. The first branch, the ________, writes the laws.**		**Congress or legislature**
506 **The second branch of the national government is the executive, or ________ of the United States.**		**President**
507 **The third and final branch of the national government is the judicial branch of the government. The national government, therefore, is made up of three parts.**	**GO TO NEXT FRAME**	
508 **The first part, or legislative, is Congress. The second part, or executive, is the President. The third part is the ________**		**judicial**
509 **This third branch, the ________, reviews the laws.**		**judicial**
510 **The ________ branch reviews the laws to see that they agree with the supreme law of the land, the ________.**		**judicial Constitution**

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SOCIAL STUDIES

GEOGRAPHY OF THE UNITED STATES U-3006
UNIVOX INSTITUTE INC.
Published by UNIVERSAL ELECTRONICS
LABORATORIES CORP.,
510 Hudson Street, Hackensack, N. J.

Programed text, 2160 frames, Paperback, 360 pp., 8½" X 11", $14.95.
For use in Univox Model "U" Teaching Machine; program reusable.
Teacher's Manual not available.
Unit, Final Diagnostic tests not available.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION:
Prerequisites:
No Additional Material required.
Time Required to Complete program: "28 to 32 hours" (based partly on data).
Student Data being used for revision.
(2 sample pages)

SOCIAL STUDIES

GEOGRAPHY OF THE UNITED STATES U-3006
Univox Institute Inc.; UNIVERSAL ELECTRONIC LABORATORIES
2 sample pages:

GEOGRAPHY U-3006

3 3 2

439 An example of a transparent object is a pane of window glass. Since the bodies of water on the Earth's surface allow the light rays to pass through them, as in the case of the window glass, the bodies of water are also said to be _______.	transparent
440 Opaque bodies, such as land masses, reflect or bend back light rays. Therefore, opaque bodies have two qualities. First, opaque bodies do not allow _______ rays to pass through them.	light
441 Second, opaque bodies bend back light rays. Therefore, the land masses of the Earth bend back or _______ light rays.	reflect
442 Bodies of water also have reflective qualities. The reflective qualities of water, however, are poorer than the reflective qualities of land. Therefore, if we were to choose the best natural reflective surface, we would choose a _______ mass.	land
443 We now have several facts concerning land masses and water bodies. Both of these features are considered part of _______ control.	climatic
444 Since land masses do not allow light rays to pass through them, they are said to be _______ bodies.	opaque

457 Transmission determines the amount of heat an area will receive and hold. Land masses heat more _______ than water bodies.	rapidly or quickly
458 Bodies of water take longer to heat and longer to lose their heat. Therefore, water will _______ slower than land after the sun goes down.	cool
459 The climates of the United States are affected, in part, by transmission. The central area of the United States, which is a land mass, will heat and cool more rapidly than the area adjoining the Atlantic Ocean, which is known as the _______ Coastal _______.	Atlantic Plain
460 We may now reach several conclusions about land and water features with regard to climatic control. First, the feature to reach a higher temperature will be the _______.	land
461 In addition, since the land is an opaque body, it will reach its highest temperature much more _______ than will a body of water.	rapidly or quickly
462 Therefore, the greatest variation in temperature will be found on the feature known as a _______ mass.	land

SOCIAL STUDIES

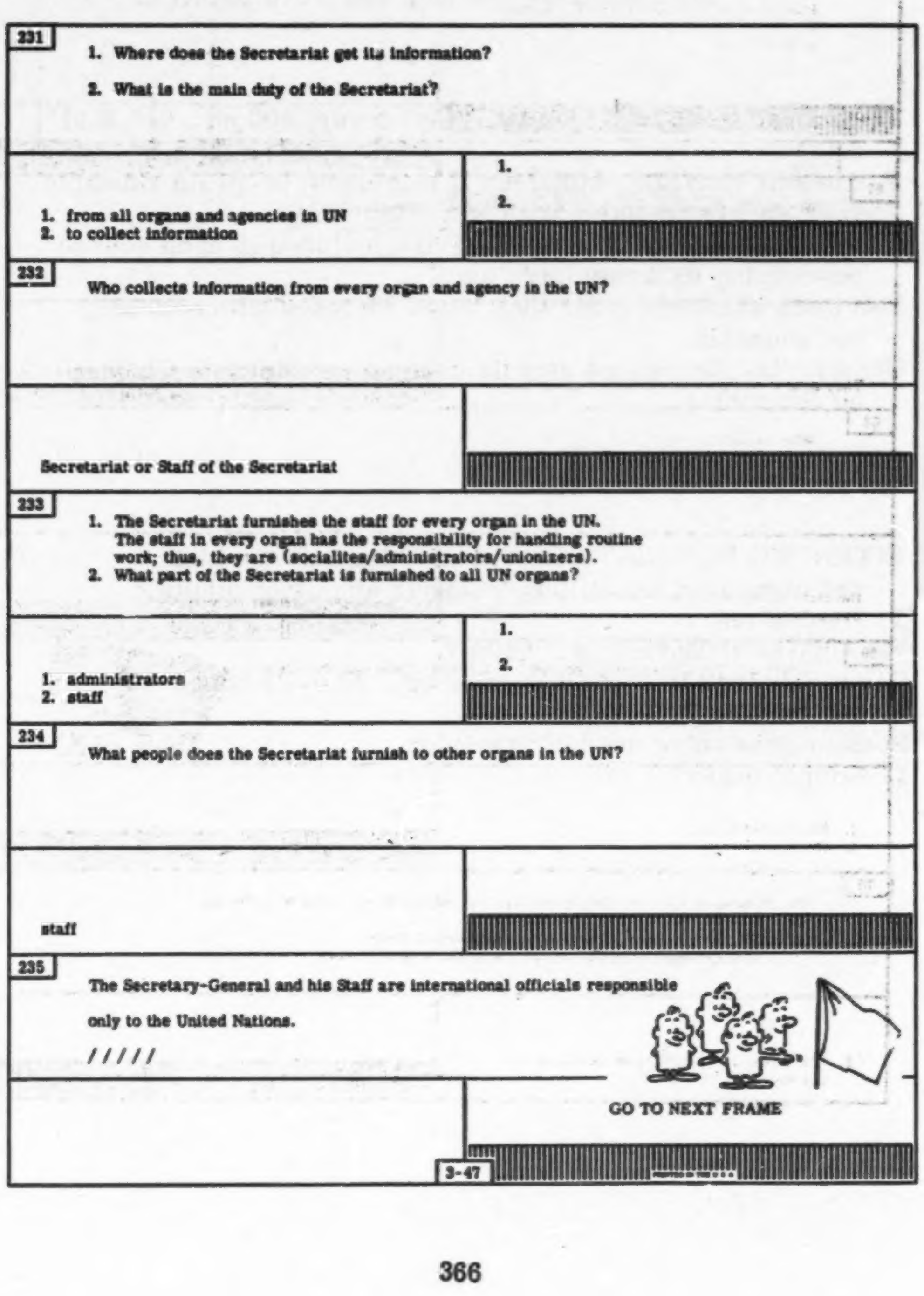
UNITED NATIONS Junior High School + +
Its Organization and Operation
BETTY PILKINGTON, Programer, consulting with
Dr. DAVID C. McKIBBIN; TMI
Published by TMI-GROLIER,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 2000 frames, Vinyl cover, 400 pp., 8½" X 11", $ (?) .
For use in Min/Max, Min/Max II machines; program reusable.
Answer sheets available with Self-Tutor only.
Teacher's Manual: "Instructions are included in each course concerning its administration."
"No tests available other than those enclosed with course"; not reusable.
Constructed Responses usually used; some Multiple Choice; no Branching.

INTENDED POPULATION: "From 8th grade up; also recommended for college students and other adults."
Prerequisites:
No Additional Materials required.
Time Required to Complete program: 20 to 25 hours (based solely on data).
Student Data being used for revision.
(2 sample pages)

SOCIAL STUDIES

UNITED NATIONS
Pilkington, McKibbin; TMI-GROLIER
2 sample pages:



231

1. Where does the Secretariat get its information?

2. What is the main duty of the Secretariat?

1. from all organs and agencies in UN
2. to collect information

1.

2.

232

Who collects information from every organ and agency in the UN?

Secretariat or Staff of the Secretariat

233

1. The Secretariat furnishes the staff for every organ in the UN. The staff in every organ has the responsibility for handling routine work; thus, they are (socialites/administrators/unionizers).
2. What part of the Secretariat is furnished to all UN organs?

1. administrators
2. staff

1.

2.

234

What people does the Secretariat furnish to other organs in the UN?

staff

235

The Secretary-General and his Staff are international officials responsible only to the United Nations.

/////

GO TO NEXT FRAME

3-47

66

Which nation did not approve the Baruch Plan in the Atomic Energy Commission in 1946?

BOTH	USA	Russia	NEITHER
		X	

67

Why did the Russians refuse to accept unlimited inspection?

They said it would violate their sovereignty.

68

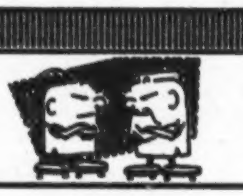
What is sovereignty?

the right of any nation to determine its own policies

69

There are two Chinese governments: Nationalist China and Red China.

List the two Chinese governments.



1.
2.

1. Nationalist China
2. Red China

70

The Nationalist Chinese government has been exiled to the island of Formosa.
Exile means to expel. Which is true?
1. The government of Nationalist China stayed home.
2. The government of Nationalist China has been sent away.

2. The government of Nationalist China has been sent away.

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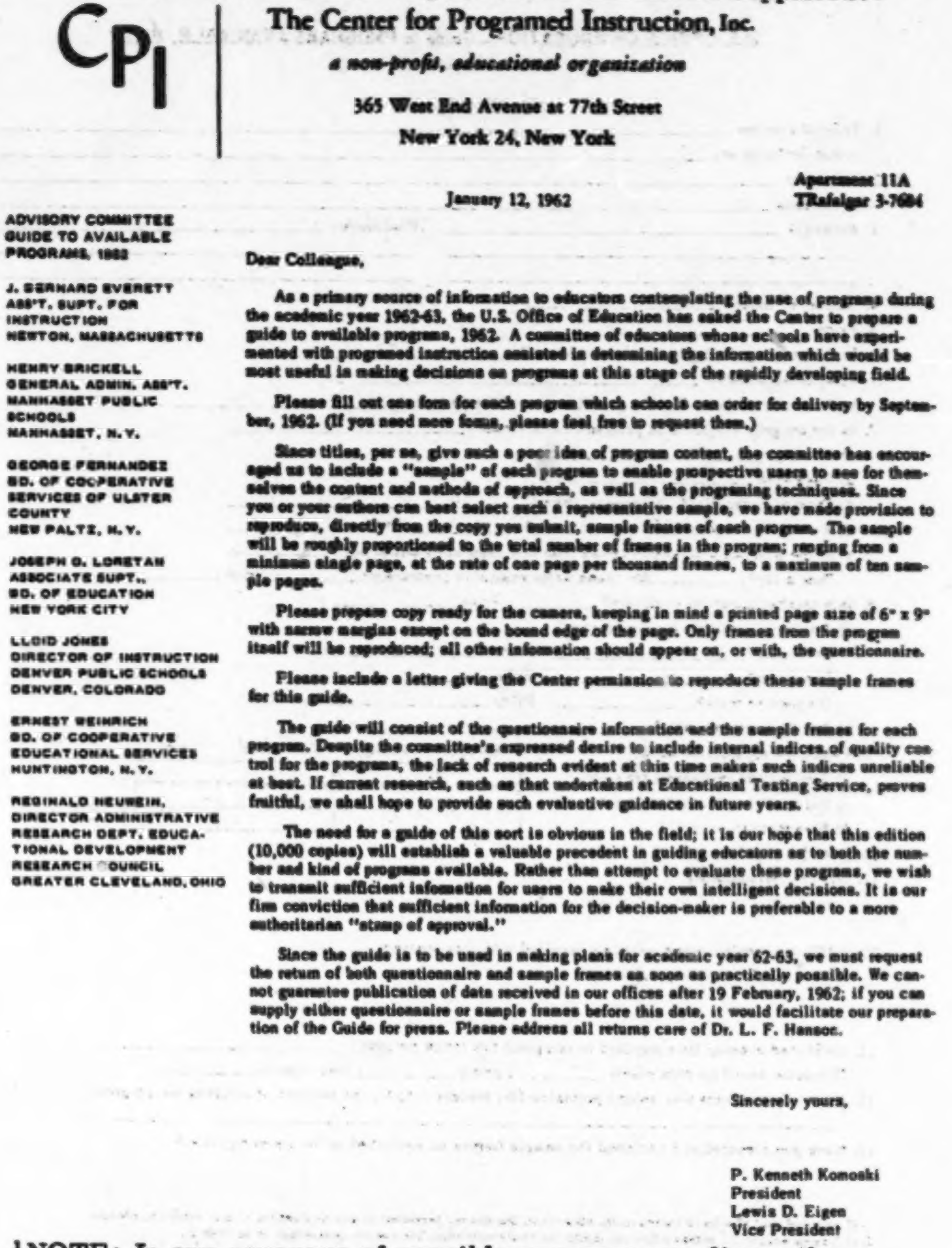
APPENDIX A

Covering letter sent to publishers and known suppliers.[1]



CPI

The Center for Programed Instruction, Inc.
a non-profit, educational organization
365 West End Avenue at 77th Street
New York 24, New York

Apartment 11A
TRafalgar 3-7684

January 12, 1962

ADVISORY COMMITTEE
GUIDE TO AVAILABLE
PROGRAMS, 1962

J. BERNARD EVERETT
ASS'T. SUPT. FOR
INSTRUCTION
NEWTON, MASSACHUSETTS

HENRY BRICKELL
GENERAL ADMIN. ASS'T.
MANHASSET PUBLIC
SCHOOLS
MANHASSET, N.Y.

GEORGE FERNANDEZ
BD. OF COOPERATIVE
SERVICES OF ULSTER
COUNTY
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NEW YORK CITY

LLOID JONES
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DENVER PUBLIC SCHOOLS
DENVER, COLORADO

ERNEST WEINRICH
BD. OF COOPERATIVE
EDUCATIONAL SERVICES
HUNTINGTON, N.Y.

REGINALD NEUWEIN,
DIRECTOR ADMINISTRATIVE
RESEARCH DEPT. EDUCATIONAL DEVELOPMENT
RESEARCH COUNCIL
GREATER CLEVELAND, OHIO

Dear Colleague,

As a primary source of information to educators contemplating the use of programs during the academic year 1962-63, the U.S. Office of Education has asked the Center to prepare a guide to available programs, 1962. A committee of educators whose schools have experimented with programed instruction assisted in determining the information which would be most useful in making decisions on programs at this stage of the rapidly developing field.

Please fill out one form for each program which schools can order for delivery by September, 1962. (If you need more forms, please feel free to request them.)

Since titles, per se, give such a poor idea of program content, the committee has encouraged us to include a "sample" of each program to enable prospective users to see for themselves the content and methods of approach, as well as the programing techniques. Since you or your authors can best select such a representative sample, we have made provision to reproduce, directly from the copy you submit, sample frames of each program. The sample will be roughly proportioned to the total number of frames in the program; ranging from a minimum single page, at the rate of one page per thousand frames, to a maximum of ten sample pages.

Please prepare copy ready for the camera, keeping in mind a printed page size of 6" x 9" with narrow margins except on the bound edge of the page. Only frames from the program itself will be reproduced; all other infomation should appear on, or with, the questionnaire.

Please include a letter giving the Center permission to reproduce these sample frames for this guide.

The guide will consist of the questionnaire information and the sample frames for each program. Despite the committee's expressed desire to include internal indices of quality control for the programs, the lack of research evident at this time makes such indices unreliable at best. If current research, such as that undertaken at Educational Testing Service, proves fruitful, we shall hope to provide such evaluative guidance in future years.

The need for a guide of this sort is obvious in the field; it is our hope that this edition (10,000 copies) will establish a valuable precedent in guiding educators as to both the number and kind of programs available. Rather than attempt to evaluate these programs, we wish to transmit sufficient infomation for users to make their own intelligent decisions. It is our fim conviction that sufficient information for the decision-maker is preferable to a more authoritarian "stamp of approval."

Since the guide is to be used in making plans for academic year 62-63, we must request the return of both questionnaire and sample frames as soon as practically possible. We cannot guarantee publication of data received in our offices after 19 February, 1962; if you can supply either questionnaire or sample frames before this date, it would facilitate our preparation of the Guide for press. Please address all returns care of Dr. L. F. Hanson.

Sincerely yours,

P. Kenneth Komoski
President
Lewis D. Eigen
Vice President

---

[1] NOTE: In our coverage of possible program suppliers, the Literary Market Place list of book publishers was circulated along with several lists of teaching machine manufacturers and the Center's general correspondence files. If we have inadvertently neglected any publisher, our apologies.

APPENDIX A

Publisher's Questionnaire.

The Center for Programed Instruction, Inc., 365 West End Ave., N.Y.C. 24

U.S. OFFICE OF EDUCATION – Guide to PROGRAMS AVAILABLE, 1962

(Use only pertinent items)

1. Title of program ____________________
   a) Sub-Title, if any ____________________
2. Publisher ____________________
   a) Address ____________________
3. Author(s) ____________________ Position(s) ____________________
4. Number of frames ____________________
5. Price ____________________
6. Is the program available in machine format? ____________________
   a) What machine(s)? ____________________
   b) Does use in these devices permit re-use of the program? ____________________
7. Is the program available in programed text format? ____________________
   a) No. of pages ____________________
   b) Page size ____________________
   c) Type of cover (Hard, Paperback, other) ____________________
   d) Are answer sheets (booklets) available? __________ Price __________
   e) Is the program published in more than one separately bound unit? __________
   How many? __________ Are these units available separately? __________ Price __________
8. Is a teacher's manual available? __________ Price __________
   a) Are tests available for the program? ____________________
   Unit tests? __________ Price __________
   Final test? __________ Price __________
   Diagnostic tests? __________ Price __________
   b) Are the tests reusable? ____________________
9. Check the appropriate boxes:

	Always	Usually	Sometimes	Never
a) Constructed responses are used	☐	☐	☐	☐
b) Multiple choice responses are used	☐	☐	☐	☐
c) Branching is used	☐	☐	☐	☐

10. Intended population(s):
11. Student prerequisites:

12. Additional equipment or materials required with this program:
    (If you supply, please give price)

11. Estimated average time required to complete the entire program ____________________
    (Estimate based on data solely __________ ; partly __________ ; just a guess __________)
12. Have you used (are you making provision for) student data for the purpose of revising the program?
    ____
13. Have you prepared and enclosed the sample frames as described in the covering letter?

If you feel that you have information, other than the above, pertinent to the evaluation of this program, please feel free to supply it; within editorial limits we shall endeavor, but cannot guarantee, to include it.

APPENDIX B

The following is a statement on self-instructional materials and devices released by a joint committee of the American Educational Research Association, the American Psychological Association, and the Department of Audio-Visual Instruction of the N.E.A.

The use of self-instructional programed learning materials in teaching machines and similar devices represents a potential contribution of great importance to American education. But this contribution can best be realized only if users have information with which to evaluate self-instructional materials. Accordingly, the following interim guide-lines have been prepared.

1. Teaching machines do not, in themselves, teach. Rather, the teaching is done by a program of instructional materials presented by the teaching machine. Any evaluation of a teaching machine thus requires an assessment of the availabilities and quality of programs for each type of machine, as well as its mechanical dependability.
2. A variety of programed materials is becoming available, but not all programs will fit all machines. Thus only those programs compatible with a particular machine can be considered as available for use with it. A list of commercially available programs and devices can be obtained by sending a request to the Department of Audio-Visual Instruction, National Education Association.
3. In evaluating the specific content which a self-instructional program purports to teach, the program can be examined to determine what the student is required to do and whether the student's responses reflect the kind of competence which the educator wishes to achieve. Like other educational materials, programs labeled with the name of a particular subject matter vary widely with respect to content and instructional objectives.
4. Just any set of question and answer material does not constitute a self-instructional program. One major type of self-instructional material proceeds by small steps requiring frequent student responses. These steps can be examined to see if they embody a careful, logical progression of

the subject matter. Items in such a program are designed so that the student will respond to the critical aspects of each item or will perform the important operation which that item was meant to teach. Furthermore such programs generally provide a wide range of examples illustrating each principle or concept.

5. Self-instructional materials are designed to adapt to individual differences by allowing each student to proceed at his own rate. Some types of self-instructional materials further adapt by "branching to alternate materials. For this purpose, questions are designed to dianose the student's needs. The material is designed so that the choice of answer to a particular question determines which items will be presented next. Incorrect answers take the student to items containing information designed to correct the error before continuing through the sequence.

6. An important feature of almost all self-instructional materials is that a record of the student's responses provide a basis for revising the program. The prospective purchaser should ask about the extent to which revision has been based on student response and how the preliminary tryout was conducted.

7. The effectiveness of a self-instructional program can be assessed by finding out what students actually learn and remember from the program. The prospective purchaser should find out whether such data are available and for what kinds of students and under what conditions the data were obtained.

8. Active experimentation with self-instructional materials and devices in school systems is to be encouraged prior to large scale adoption.

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